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A Proposition for How Musical Competencies Could Benefit 3D Character Animators When Synchronising Performances to Pre-recorded Music Using *Khumba* as a Case Study

Carelize Johani Jacobs

Research Report

Master of Arts in Digital Animation
(Coursework and Research Report)

University of the Witwatersrand

Faculty of Humanities

The Wits School of Arts

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Declaration

I declare that this research report is my own unaided work. It is submitted in partial fulfilment for the Master of Arts degree in the field of Digital Animation by Coursework and Research Report at the University of the Witwatersrand, Johannesburg. This report has not been previously submitted for any degree or examination at any other university or institution of higher learning.



Carelize Jacobs

On this 5th day of June 2017.

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Introduction

Animation is a time-based art with each animated action or movement taking place against a specific speed or tempo (Floyd). Timing helps to define the physical characteristics of an object such as its weight, its size and its scale. It helps to communicate the personality, mood and emotional state of an object or character (Hinman 195). The subtle adjustments in timing in Warner Bros' cartoon *Wile E. Coyote and the Road Runner,* for example, communicate the physicality and mood of the eager *Wile E. Coyote* as he frantically chases the quick, good-natured *Road Runner*, who in contrast, moves with ease. When a sequence of animation "works", every animated movement is perceived as if it happens precisely when it should. For this reason, timing can be seen as the most fundamental of the twelve foundational principles of animation (Floyd) and in some ways, the most difficult principle for animators to master (Hinman 195).

All cinema, including animation film, is based on "the illusion of movement that occurs when a series of images are exchanged quickly enough that the human eye no longer sees them as separate images, but as a single motion" (Subotnick 3). Where the two categories of cinema (live-action and animation) diverge is in the representation of reality. In general, live-action cinema – which is created through a recording method – creates the illusion that what we see on the screen is real, while animation generally does not. Part of the attraction of animation is the awareness of the illusion that is brought to the viewer through constructed media (Subotnick 3).

In her blog, Rundell argues that the illusion of movement crafted in animation is not only a representation of time, but that time in animation is experienced as an objective reality that comes with animated space. Timing and spacing are closely linked. Whereas timing in its simplest form describes "when" something moves, spacing describes "how" far something moves or changes from one position to the next. The bigger the change in position, the faster that movement will appear (Floyd). In animation, the experience of space by means of motion (time) is affected by the crafted quality of both space and time (Rundell).

The illusion of space, Rundell explains, is less convincing than the illusion of motion (and thus time), and argues: "We understand very well that the images we see on a screen do not have the depth and space that we actually see – we could not reach out and enter the filmic setting. We are very aware of the illusion at a perceptual level. Motion, on the other hand, is harder to see through".

Just like animation, music is an art based in time (Subotnick 3). Where animation gives a representation of time by changing the qualities of an image using line, composition, colour and texture to construct a moving picture in time, music gives a far more subjective presentation and thus sensation of time by changing pitch, dynamics, rhythm, and tempo to construct an audial 'picture' (Rundell; Subotnick 3). In Rundell's words: "Music is a metaphor for human consciousness (of Being) and animation is heightened because of its inclusion of music; music's 'transitoriness' gives substance to images which themselves are an illusion of motion and which exist through time and the illusion of space and depth".

Sound in animation film, Musburger and Kindem argue, complements the image and can shape the way in which images are interpreted: "It can direct the audience's attention to a specific part of the image or to things not included in the image" (159). They go on to argue that certain sounds, including musical sounds, "have the ability to stimulate feelings directly. Sound can create a realistic background or a unique, abstract, impressionistic world" (ibid). Sounds and images, Musburger and Kindem continue, can have parallel meanings or emotions that are mutually supportive (160). Not only can music reinforce, but it can also purposefully contradict the animated image (ibid).

Music in film, including animation film, is often categorised as either diegetic or non-diegetic (Beauchamp, "Designing Sound 1st Ed" 17).[1] Diegetic music is understood to emanate from a source in the fictional narrative or "diegesis" (ibid). Hence it is also known as "source music". These sources may include characters depicted as musicians making music in the film, a radio 'playing' music, etc. Whether or not the audience sees the source is unimportant. So long as they understand the music to be coming from something within the depicted world of the film itself, it qualifies as diegetic music. Thus, we accept that animated characters 'hear' diegetic music in a scene. Conversely, non-diegetic music is understood to emanate from outside the depicted world of the film, so the characters do not 'hear' it (ibid). Other names for this type of music include "underscore", "accompanimental music", "interpolated music", "commentary music", and perhaps most commonly, "background music" (even when such music is foregrounded on a film's soundtrack[2]).[3]

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[1] While Claudia Gorbman standardised the terms in her pioneering film music study *Unheard Melodies: Narrative Film Music* (1987) it should be noted that film music scholars have long argued over the appropriateness of the terms, and a number of theorists have drawn attention to the many examples that blur the boundaries between the simplistic binaries (see in particular Robynn Stilwell's 'The Fantastical Gap between Diegetic and Nondiegetic' in Daniel, Kramer and Leppert 184).

[2] A soundtrack is a combination of voices, sound effects and music (Furniss, "Art in Motion" 83).

[3] Of course, all film sound is artificially constructed to tell a story (dialogue is very often rerecorded in post-production with ambient sound and sound effects added, sound edited, layered and mixed, etc.) and audiences are required to suspend their disbelief in thinking about what a character on screen might be able

Synchronised diegetic or source music matches the apparent on-screen source of that music (Musburger and Kindem 160). For example, in a singing performance the music would synchronise with the lip movements of the animated character singing or in a dance scene, the visual actions of the character would precisely follow the music's beat or rhythm.

The use of music in film is a rather complex art (Musburger and Kindem 161) and as Halas and Manvell argue: "The animator is responsible for the vision, the control of the total medium, including sound as well as sight. He [sic] must think sound as well as picture. He is only half an animator if his skill is limited to drawing" (81).

Many earlier cartoons, such as Warner Bros' *Wile E. Coyote and the Road Runner* featured wall-to-wall (non-stop) music that was often a blend of underscore and musical sound effect (Beauchamp, "Designing Sound 1st Ed" 44). In contrast, animated features produced later, such as Disney's *Snow White and the Seven Dwarfs* (1937), contained singing and dancing performances and songs that were fluidly linked to characters and their actions (Goldmark and Taylor 26). More recent animated feature films, such as *Aladdin* (1992), *The Lion King* (1994), *Tarzan* (1999) and *Frozen* (2013) are invariably accompanied and driven by a prominent and compelling soundtrack, closely tied to plot developments, making music an essential element of the animated film.

The focus of this research is on 3D animated feature films with musical scenes, rather than a broader consideration of music in animation feature films – the latter including background music, underscoring, etc. A musical scene, for the purpose of this study, can be defined as any animated scene in which a character takes part in a musical performance whether by singing, dancing, playing a musical instrument or any other action requiring synchronisation to source music.

Animation film can make use of two kinds of music to combine animated images and music: original music composed and recorded for the film or, pre-existing music compiled for the film. Commissioning an original score means music can be tailor-made for the specific needs of an animation film (Musburger and Kindem 163), but this can create complexities for the production process.[4] However, in some cases pre-existing music is preferred to create a desired effect.

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to hear or not hear. One could argue that this act of suspension is even more necessary in the case of animated characters, the source of the representation being simply a drawing or a manipulation of pixels.

[4] The process of animation very often requires music, particularly for scenes in which characters interact with music, while the composer would very often require some kind of moving image material to compose to or for.

This research will focus on pre-recorded source music, i.e. fully completed or demo recordings (scratch tracks) of original or recordings of pre-existing music. Music on a temp track[5], even though it contains certain musical information, is excluded from the category of music this study focuses on, as the possibility exists that major changes might occur between the temp track and the final music used in the film.

With pre-recorded music, a basic structure and timing is established to which the musical performance and animated images must conform, unless a conscious asynchronisation or contrapuntal relation between the sounds and images is desired (Musburger and Kindem 161). Visual actions are created according to a pattern set by pre-recorded music. The timing of the movement coincides with the timing of the music so that the movement and the music both begins and ends at the same point and various "hit" points or points of synchronisation are achieved. Animating performances to music, therefore, requires a high degree of synchronisation or parallelism between the music and visuals (Musburger and Kindem 161).

The introduction of synchronised sound in the animated short film *Steamboat Willie* (1928) brought about the development of various techniques for music and image interaction. "Mickey Mousing", a technique pioneered by Disney in the 1930s, is a term that refers to the precise synchronisation of sound and movement to emphasise an action (Furniss, "Art in Motion" 91). Another technique employed to make actions more believable was rotoscoping[6]. Contemporary animators still use traditional methods, but are aided by computers and computer software (Furniss, "Animation Bible" 25).

According to Beauchamp, because sound is often needed to guide the animation process with animated musical films (or feature films containing musical scenes), it should not be delayed until post-production ("Designing Sound 1st Ed" 29).[7] Unfortunately the soundtrack, Beauchamp argues, has historically taken a back seat to image in terms of resource allocation, allotment of production time, and screen crediting. However, many experienced animators credit sound with contributing as much as 70% to the success of a project ("Designing Sound 1st Ed" 17).

[5] A temp track is a preliminary audio recording of music that merely serves as a guideline for the animators during the production phase on the mood and tempo the director is looking for in a scene. It is replaced before the release of a film by the final soundtrack (Croudace).

[6] Rotoscoping was patented by Max Fleischer in 1917 and consisted of tracing a life action film of dance or movement projected one frame at a time. This enabled animators to create more life-like movement (Goldmark, "Tunes for 'Toons" 148).

[7] It is worth noting that *Steamboat Willie*'s music, a score of compiled pre-existing compositions arranged specially for the film, was unusually recorded *after* the film was animated.

Despite the long history of animating to music, the deployment process remains project dependent. There are examples of isolated best practice (as evident from various animator blog sites) using methods, such as, click tracks[8], charts (soundtrack production charts), bar sheets[9] and, x-sheets (exposure sheets). However, there seems to be no universally-agreed approach for notation in animating to music, that is, an approach using musical information as cues to animate motion. Perhaps the problem lies elsewhere. Perhaps animators understand and know about animation but not enough of music.

Michael Powell, an English film director best known for films such as *The Red Shoes* (1948), *A Matter of Life and Death* (1946) and *Peeping Tom* (1960) and admired by many modern-day film directors, aspired to his cinematic ideal – the so-called composed film (Moor, "Powell and Pressburger" 11). By this he meant, technically, a form of filmmaking in which a soundtrack is recorded first and footage is then shot, with shots timed to the second to coincide with the governing musical line (Moor, "Gothic Riots" 1). Powell suggests that the term 'composed film' also has a general meaning which was just as important to him, "for he saw in this form of filmmaking possibilities to orchestrate all aspects of film – colour, lighting, sets, costume, music, camera work, drama – towards a single expressive end" (Moor, "Gothic Riots" 1).

Although Powell did not work with animated film, his ideal could be applied to these films. One of the many remaining challenges in animating to music, despite many technological advances, is to perfectly time the performances to the music. The earliest animators benefited from having a basic knowledge of music, especially rhythm and tempo (Thomas and Johnston 290). This understanding of music was seen as essential, complementing their drawing and animation abilities (ibid). In Walt Disney's own words: "I think a good study of music would be indispensable to the animators – a realization on their part of how primitive music is, how natural it is for people to want to go to music – a study of rhythm, the dance – the various rhythms that enter into our lives every day" (Thomas and Johnston 285).

Subotnick describes animation as an eclectic art, meaning that animators have diverse interests and come from diverse backgrounds and experiences, all of which expand the technical possibilities of animation (5). He maintains that there is no correct way to create animation except the way that best

[8] A click track is an audio track which generates a sequence of regular pulses (beats) at a particular tempo (Goldmark, "Tunes for 'Toons" 49).
[9] A bar sheet or bar chart is a way of notating sound, music, dialogue and action in a systematic manner (Webster 182).

meets the requirements of the performance required. Music is one such interest that has contributed to the creation of new tools in animation such as a bar sheet (ibid).

The blog sites of contemporary animators such as Carlos Baena highlight the belief that knowledge and an understanding of music can be helpful. Baena, an animation veteran who worked at Pixar, Paramount Pictures, and is an Animation Mentor co-founder, reiterates the importance of musicality and describes animation as "visual music"[10] meaning that animation is very similar to making music, not through sounds but through images (Baena). Although a different approach to the focus of this study, the statement supports that animators can benefit holistically from understanding music and basic musical concepts.

According to Coyle, animation has been relatively under-examined in film-sound research (5). Even students studying animation often perceive sound as an afterthought (Webster 181) or merely approach it as a collaborative endeavour across disciplines. Furthermore, animation courses which cover the topic of music and animation integration are scarce. Consequently, there are gaps relating to soundtrack aesthetics and workflow that can make it difficult for the animator working independently on musical scenes to collaborate effectively with the sound design team (Beauchamp, "Designing Sound 2nd Ed" XXIV).

This, therefore, supports the need to investigate the musical knowledge and skills gap of contemporary character animators to identify the most critical musical competencies they require to create animation that best represents the musical score.

This research explores the relationship between music and character animation from the perspective of the animator. Despite a growing academic interest in both film music and animation, little attention has been given to the link between these two fields in terms of how they developed and are deployed together (Coyle 1). With this study I attempt to further bridge these worlds by investigating and suggesting the ideal musical competency set a character animator would benefit from and how they can use these competencies to digitally animate characters moving to the beat of pre-recorded music for a 3D animation feature-length film. A qualitative research approach is followed. The research

[10] Visual music can also be a visual representation of sound through abstract moving shapes emulated through the use of a computer (Ox and Keefer). Note that Baena refers here to visual music in a different manner.

methodology consists of a historical analysis, studying current practices and the analysis of a case study.

Khumba (2013), made by Triggerfish Animation Studios, is a South African 3D computer-animated feature film that contains musical scenes and is the case study that I analysed in order to establish an initial ideal musical competency set the character animators could have benefited from when they animated the movements of characters in particular scenes to fit the pre-composed score. I chose this animation film as it is imperative for the research to have access to the character animators who worked on the film. Unfortunately this means that the research is representative of one studio and one film which was made under specific circumstances. Even though this may not offer a holistic view, it does not detract from the research goal I was aiming to accomplish.

By attempting to identify the most critical musical competencies, I believe that character animators working with musical scenes will be in a better position to target their continuous learning efforts. Universities and other training providers will also have greater insight into the process, which may lead to more research and the introduction of short courses teaching character animators basic musical competencies. The main outcome of this research would be to heighten the proficiency of character animators working on 3D feature-length films to create performances where characters move more believably to the beat of pre-recorded music. Ultimately, this research can lead to finding a universally-agreed approach for notation in animating to music combining both traditional and new methods and techniques.

The research report is divided into six sections. This section introduced and motivated the study, while also explaining the methodology followed to perform the research. Chapter 1, the literature reviews, explores the body of knowledge on the relationship between music and animating a performance. Chapter 2 presents a literary investigation that compiles a basic set of theoretical knowledge and skills in music, which might be useful for character animators. This chapter is complemented by a literary investigation probing the backgrounds of earlier and contemporary character animators to establish their views and feelings about the relationships between music and animation, as well as their affiliation to music - meaning whether they have a musical interest and/or musical knowledge and skills. The scenes in *Khumba* where the movements were animated to fit the music, are identified and one of the scenes analysed in Chapter 3. The analysis is performed by mapping the movements of the characters and movement of the music as part of the performance at a specific time. This is followed by conducting one-on-one semi-structured interviews with the lead animators and character

animators who created the animated musical scenes in *Khumba*. Open-ended questions pertaining to the animation process and the animators' musical talents and knowledge were asked during these interviews (see the Interview Questions Guide in Appendix 1.) The transcript of the audio recordings of the interviews is included in Appendix 2. The comparison and analysis of the answers of the animators on the production processes and how the performances of the characters were manipulated and integrated with the music in the musical scenes are also included in Chapter 3. Appendix 3 lists the video clips which are discussed in this report and which can be found on the accompanying CD. In Chapter 4 the answers of the animators on what musical knowledge and skills they have and how they use it, as well as an illustration of how *Khumba*'s character animators could have benefited from musical competencies (the proposed notation) are presented. In the final section of the report, the research is concluded with a summary of the study, its limitations and suggestions for future research.

Chapter 1:

The Evolution of Integrating Music and Animation

1.1 Introduction

The academic discipline of animation (as a form of audio-visual film) developed separately from scholarship in the field of film music (Coyle 1). While ample research has been conducted over the years on film music or scoring, not much has been written on the development of animation after the Golden Age[11] (Goldmark, "Drawing a New Narrative" 229). One possible reason, according to Goldmark, can be the overwhelming impact Disney's animated feature films had on the field of animation (ibid). Another possible explanation can be the rapidity of change in the area of animation after the Golden Age. Technology evolves so quickly that it is difficult to present a current view of what is happening in the field: "By the time something is printed and distributed (even electronically), it seems another change has occurred" (Furniss, "Art in Motion" 174).

Rebecca Coyle, who wrote the first book of its kind, *Drawn to Sound,* connecting animation film and music, says that relatively few researchers in animation and film music have devoted time to the deployment of sound and music in animation (1-13). According to Coyle, this can be due to the fact that animation literature concentrates on visual aesthetics and style (8). "A considerable proportion of animation output and, therefore, research and writing has derived from design and graphics centres rather than film schools. As a result, the connection with sound as part of an audio-visual screen product has been peripheral" (Coyle 7). Furthermore, Coyle asserts that the production personnel concerned with sound and music was given little credit and that sound and music in many cases "have been designated as a post-production activity that is outsourced and underfunded" (8).

Goldmark remarks that "trying to survey the evolution and changes in scoring methods with animation is a complicated task" and that the most basic of timelines for the development of cartoon scoring in Hollywood does not exist (Goldmark, "Drawing a New Narrative" 229-232). To close this gap, Goldmark, who writes from a musical and not from an animation perspective (highlighting yet again the lack of scholarly work from the latter perspective), presents an overview of some trends in

[11] The Golden Age refers to the time between the start of synchronised animation in 1928 and the arrival of television in the late 1940s. It relates to a period in which the "Polka", featured in Dimitri Shostakovich's *The Golden Age* ballet composed in 1928, foreshadowed a musical style that would become synonymous with early animation (Beauchamp, "Designing Sound 1st Ed" 44).

animated films (shorts and features) produced as part of the Hollywood studio[12] system both for theatrical release and those devised for television ("Drawing a New Narrative" 229). Even though he identifies many standard working practices, these all became obsolete with a closer look at what differentiates the studios (especially when it comes to sound and animation).

There is therefore a need for this research that, from an animation perspective, will advance the deployment practices and processes for integrating film music and animation. However, to do so, it is first necessary to explore key historical developments in the integration of music and animation from its inception to what happened after the Golden Age. The presentation of a predominantly American- and Disney-centred analysis, is due to Disney Studio's dominance of the world-renowned Hollywood animation industry and their many examples of experimentation and innovation – also in integrating music and animation (Furniss, "Art in Motion" 23; Ghez Preface). Disney Studio was considered to be the leader in terms of artistic innovation and was commercially more successful than other studios such as Fleisher Studio which, together with Disney, were the only animation studios conducting research and development on a sustained basis at that time (Langer 349). The exploration of knowledge in this chapter is concluded with a discussion of the issues involved in aiming for the ultimate goal when integrating music and animation.

1.2 The dawn of a new language: integrating music and animation

During the silent age[13] of animation (from the early 1900s up to the late 1920s) cartoons were both seen and presented as moving comic strips, sometimes even incorporating speech bubbles for their dialogue. It was a time of much experimentation with the medium. Winsor McCay, the creator of the first animated cartoon star Gertie the Dinosaur (1914), experimented with animation as an extension of the comics he was working on, while Pat Sullivan and Otto Messmer created the iconic cartoon star Felix the Cat in 1919. Max and Dave Fleisher established themselves in this era with their *Out of the Inkwell* series in the same year, starring Koko the Clown. Experimental filmmakers such as Oskar Wilhelm Fischinger, Leonard Charles Huia "Len" Lye, Harry Everett Smith, Norman McLaren and others

[12] It is worth noting that although this research focuses on studio animation, there is much to learn from independent animation where perhaps smaller scale production facilitates more sustained collaborations between the animator and the musician and/or composer; Michaël Dudok De Wit's *The Monk and the Fish* (1994) stands out as a film conceived, developed and produced through close proximities between music and animation.

[13] Note that cartoons during the silent age were rarely screened without music. Although technology did not allow for synchronised sound until the late 1920s, cartoons were almost always accompanied by live music or in some cases, gramophone recordings (Altman 648).

also contributed much to the understanding of the relationship between animation and sound and did so undistracted by figurative and narrative concerns, i.e. via 'pure' animation.

A major outcome of experimentation during this period was the move towards cel animation. Animators used to redraw every single frame of animation on paper which was very time consuming (Butler 328-9). In seeking a more cost-effective mode of production, Earl Hurd and John Randolph Bray in 1915, developed the cel animation technique. This consists of separating portions of a drawing onto different layers of celluloid to eliminate the necessity for re-drawing the entire composition for every frame (Butler 328). The process also lends itself to the central component of Taylorism - to achieve greater efficiency and cooperation within the production process (Crafton 163-7). The shift to cel animation came just before another more significant technological innovation, namely the rise of sound technology in the late 1920s (Butler 328).

Upon seeing the power of sound in films with the release of *The Jazz Singer* in 1927, film studios were very eager to get sound films into production, including the cartoon studios like Disney Studios (Butler 329). In November 1928 Disney Studios released *Steamboat Willie* which features a clothes-wearing rodent named Mickey Mouse performing to the folk song "Turkey in the Straw" (Thomas and Johnston[14] 20). This cartoon marked an animation landmark with its synchronised sound. Synchronised sound was one of various technical innovations that the Disney Studio used and which distinguished their productions from those of its competitors (Rowley). This innovation resulted in an early tendency at Disney towards developing very close relationships between music and sound (ibid). With *Steamboat Willie*, Walt Disney wanted to display this technological advance insisting on an extremely tight musical integration (ibid).

[14] Frank Thomas and Ollie Johnston were two of the nine supervising animators at Disney Studios from 1934 until 1978 who Walt Disney affectionately called the "Nine Old Men", and who were known for creating Disney's most famous works, as well as refining the twelve principles of animation (Deja).

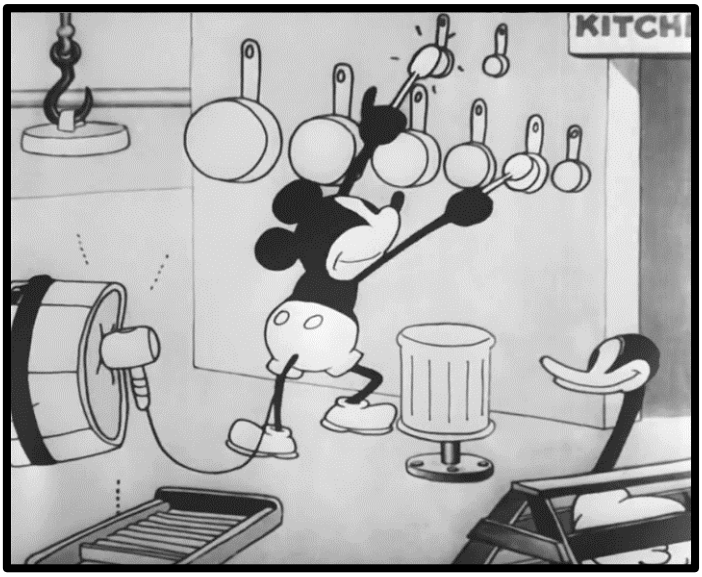


Figure 1: Mickey Mouse performing to the folk song "Turkey in the Straw" in *Steamboat Willie* (1928) – one of the first animated short films with a synchronised soundtrack (music synchronised to action). Screenshot by Author. Walt Disney Animation Studios. "Steamboat Willie." *YouTube*, uploaded by Walt Disney Animation Studios, 27 Aug. 2009. Accessed 24 June 2016.

While this cartoon was Disney Studio's first animated short film with synchronised sound, other studios had exhibited cartoons with synchronised soundtracks before, such as Max Fleischer's series "Song Car-Tunes" made in 1924, and including *My Old Kentucky Home* (1926) and *Paul Terry's Dinner Time* (1928) (Goldmark and Taylor 6).

In the earlier days music was always composed after the cartoon was animated or the music was performed live while the cartoon was shown. However, composers, such as Carl Stalling, who worked with Disney at that time, felt that music was too often being used either as a novelty or an after-thought (Goldmark, "Drawing a New Narrative" 232). It was because of these concerns and the desires of composers to see musical scores evolve, that Disney for the first time started producing films in which the animation was created around the music instead of the other way around (ibid). Their experimental series "Silly Symphonies*",* where the production approach was reversed (the creation of the music preceded the animation), was a great success and received several awards. Where *Steamboat Willie* had music that was synchronised to the action, the first Silly Symphony, *The Skeleton Dance* (1929), was animated to pre-existing music. The overall effect of this resulted in an animated ballet, where characters' movements flow so well with the music that we can't tell which came first. It is this close relationship between sound and image that according to Goldmark, "effectively raises the awareness of score to the level of a performance" (ibid).

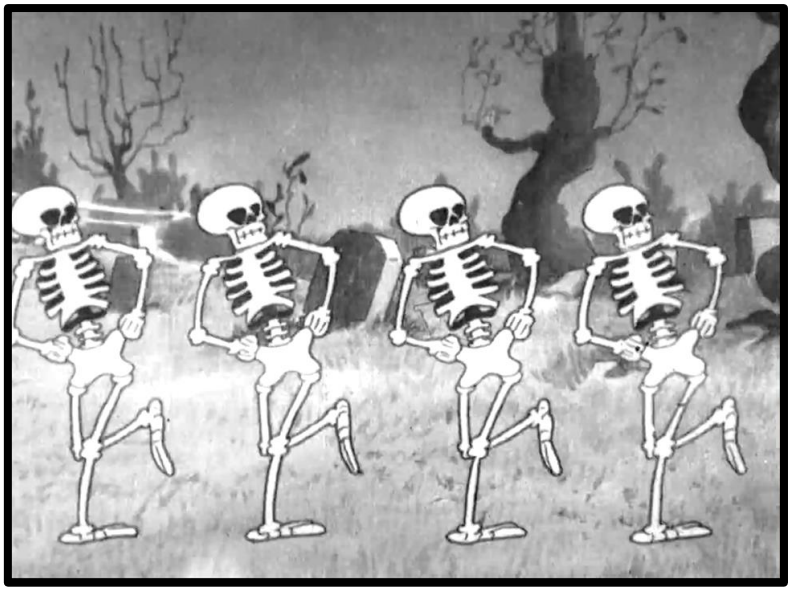


Figure 2: *The Skeleton Dance* (1929) from the 'Silly Symphonies' series – the first short film animated to a musical score (action synchronised to music). Screenshot by Author. Walt Disney Animation Studios. "Silly Symphonies." YouTube, uploaded by Walt Disney Animation Studios, 15 Oct. 2015. Accessed 24 June 2016.

In 1928 there was no formula on how to successfully pair music to animation, so that they grew and developed alongside one another (Thomas and Johnston 287). To improvise a score after the film was completed was, according to Thomas and Johnston, an easy task, but to do it the other way around was almost unthinkable (ibid). That is until Wilfred Jackson, an animator, arranger, composer and director at Disney, came along with a very simple solution: the metronome (ibid). He reasoned that if a film ran at a constant speed of 24 frames per second, you just had to determine how much music went by in a second. Jackson had sufficient knowledge of music to figure out how the beats, bars and staffs all relate to the timing of the animation (ibid). After much experimentation a new 'language' was discovered. (Which, incidentally, only worked if the whole song adhered to a strict beat.)

How did Wilfred Jackson's new 'language' work? Thomas and Johnston (287) showed that the animation director and the musicians worked closely together in the director's office called the Music Room. The musician would change elements of the music and the director would enhance the actions until both were satisfied. The animator director would mark down the action on a bar sheet (see an example of a bar sheet in figure 3). The music or sound could then be matched accurately to specific frames, which made it easier for the animators to work to specific marked points.

An animator at Disney, at the start of a project, would receive a tape or record of the soundtrack, an exposure sheet[15] (an exact copy of the scene as it appears on the grey together with suggestions for accents to be caught or certain staging to be maintained), a copy of the final storyboards to see how the animator's scene fits into the whole sequence, and the layout showing the size of the characters, their suggested positions, and the extent of their movements. The animators then had to apply their minds to the information in the handout and discuss it with the director (Thomas and Johnston 223-4). (Figure 4 shows an example of an exposure sheet.)

[15] The classical exposure sheet is also called the X-sheet or dope sheet (Williams 70).

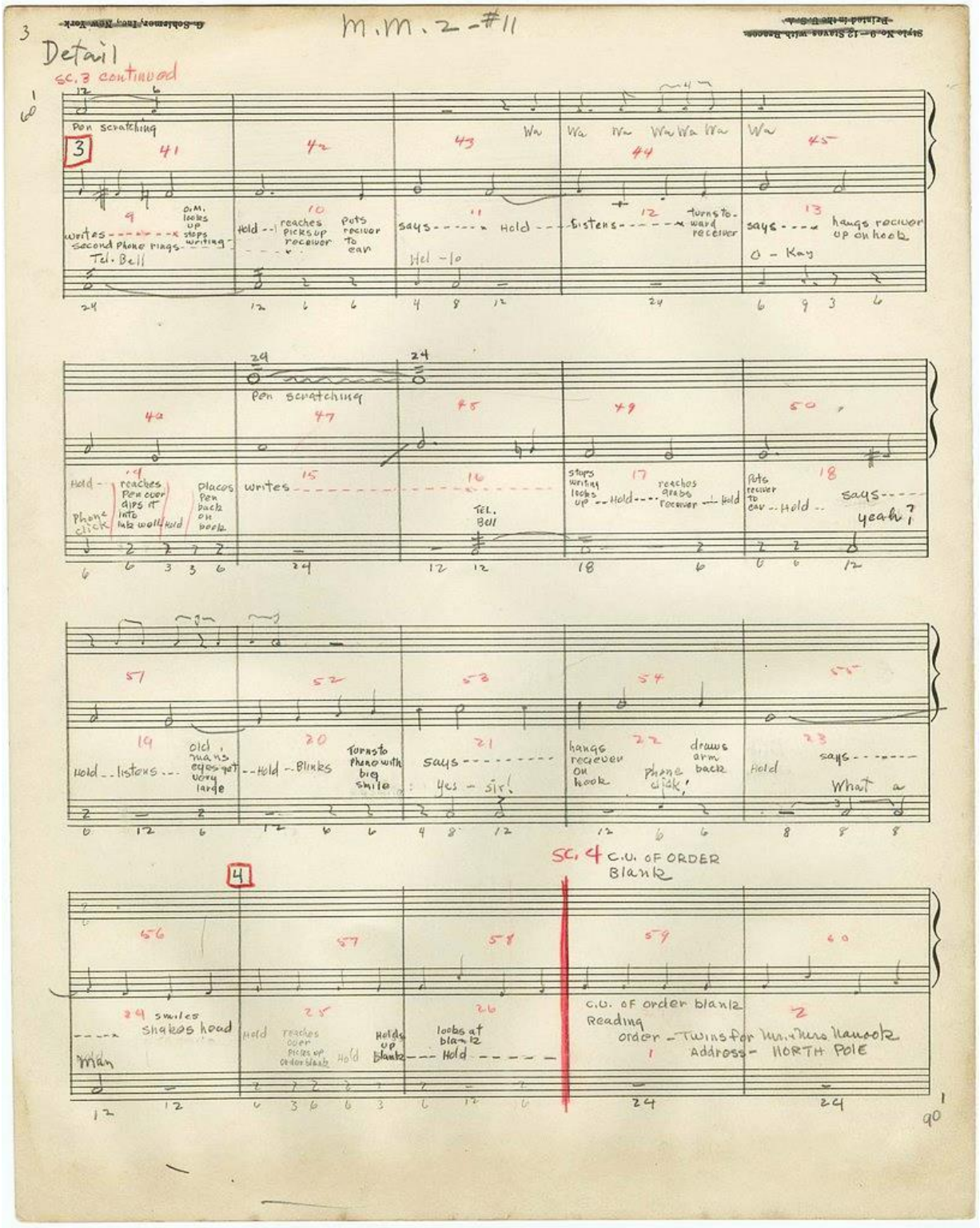


Figure 3: A page of the bar sheet for the 1933 'Merrie Melodies' cartoon, *Shuffle Off To Buffalo* prepared by the director, Rudy Ising, and the musical director, Frank Marsales. Digital image. Worth, Stephen. *Animation: Musical Timing Rediscovered.* Animation Resources, 26 Oct. 2015. Accessed 27 Aug. 2016.

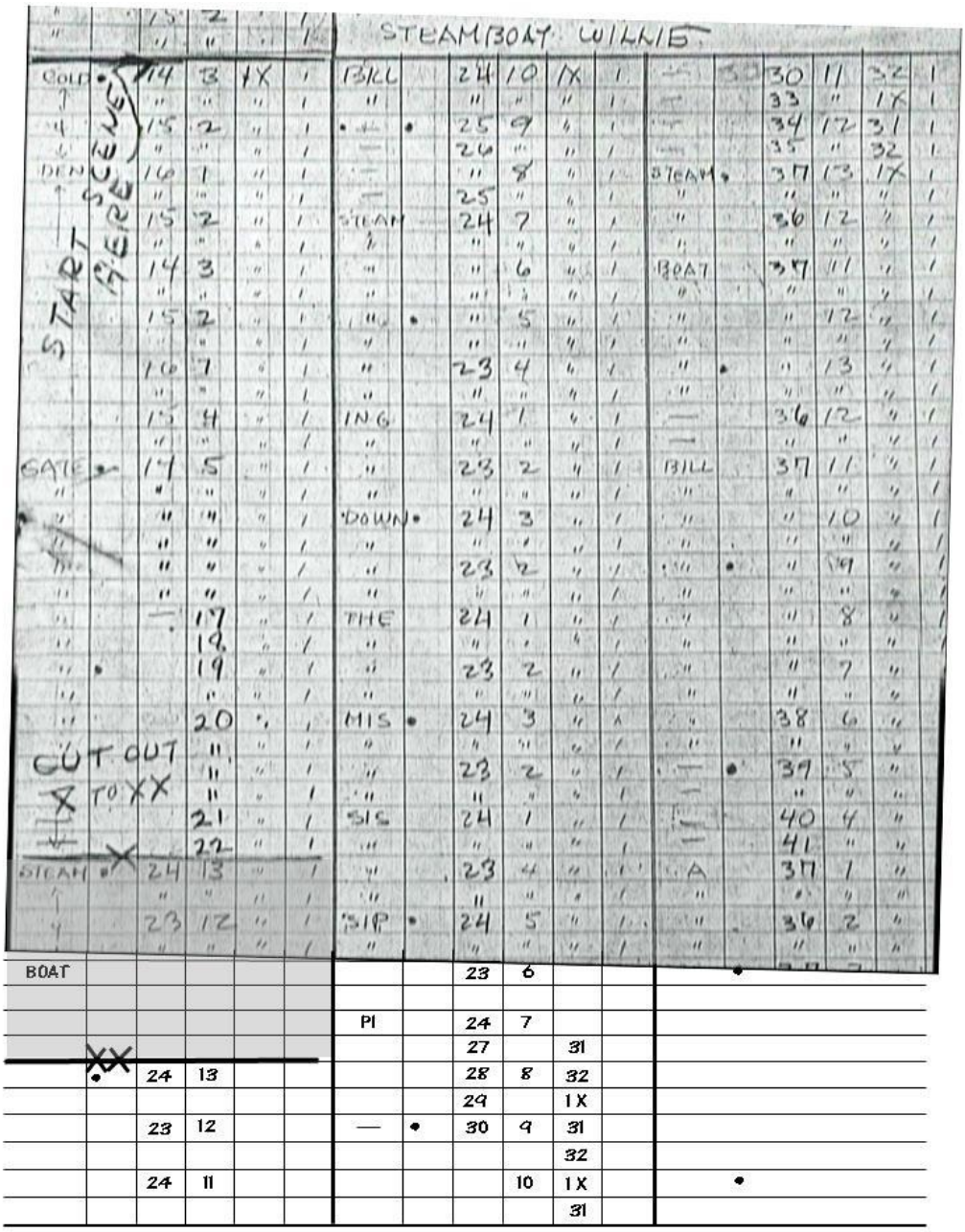


Figure 4: The exposure sheet of the first public close-up of Mickey Mouse in *Steamboat Willie* prepared by Ub Iwerks. Digital Image from film. Perk, Hans. *Steamboat Willie Exposure Sheet,* "The Hand Behind the Mouse." Disney Treasures DVD set for 'Oswald the Lucky Rabbit'. A. Filma L.A, 17 Feb. 2009. Accessed 27 Aug. 2016.

Since the arrival of sound in cartoons up to the late thirties, "music and animation had been one" (Thomas and Johnston 288). Wilfred Jackson expressed the general feeling: "I do not believe there was much thought given to the music as one thing and the animation as another. I believe we conceived of them as elements which we were trying to fuse into a whole new thing that would be more than simply movement plus sound" (ibid). Jerome Kern, one of the most important American theatre composers of the early 20th century, recognised the artistry in this process and claimed that a

distinct new musical form had been created. He termed it "the use of music as language" and credited Walt Disney with making an outstanding contribution to the music of his time (ibid).

1.3 Developments in animating-to-music during and after the Golden Age

The silent age was succeeded by the far better-known Golden Age of American animation. It is almost impossible to recount the history of the Disney Studio in the 1930s without mentioning its drive towards a particular kind of verisimilitude in its cartoons (Rowley). This is then also the main thread in Michael Barrier's narrative on the history of studio animation. Barrier explains that it is difficult to achieve this in animation and argues that Disney Studio's main creative achievement during the Golden Age was the extent to which the animators achieved this goal (193-235).

According to Wells, Disney's cartoons seek to artificially create their own "world" which is represented as "real" within itself (25). However in the quest for "realism", the concept of "realism" remains slippery and changes with the development of technology (Rowley). While expressing misgivings about this concept in animated film, Wells nevertheless suggests that the kind of realism in Disney films can be used as the yardstick by which other animations can be measured for its relative degree of "realism" (25).

Sound is one way in which the Disney Studio attempted to achieve a particular kind of verisimilitude (Barrier 3). Wells suggests that the sound in Disney films closely corresponds to the conventions of classical Hollywood live-action cinema as it "demonstrate(s) diegetic appropriateness and correspond(s) directly to the context from which it emerges" (25). Classical models of live-action cinema generally follow a less strict model where sounds are usually diegetically appropriate, but where certain types of non-diegetic sounds (such as musical score, or voice-over narration) are also accepted (Rowley). Although somewhat similar, the nature of the animated film complicates the relationship between sound and image, and leads to some subtle but important differences in what is accepted as realistic (ibid).

Unlike live-action cinema, animation does not contain any images of actual real-world locations or actual sounds (Rowley). Furthermore, in live-action cinema, "the soundtrack is…constructed either along with, or after, the image, and the main diegetic components of sound are either recorded 'real' sounds or carefully recorded facsimiles" (ibid). In animation, in contrast, no production sound, argues Rowley, exists: When Snow White takes a bite from the apple, for example, there is no crunchy apple

to bite (ibid). Also, the dialogue, which is "one of the most central aspects of the soundtrack", is recorded separately from its source (ibid). An advantage of this disconnect between the voice and its source is that it "allows for the use of extreme vocal styles that would not usually be appropriate" in a live-action film (ibid). For example, Donald Duck's iconic voice is diegetically appropriate in animation film, but not in live-action film. In fact, in animation "the separation of image and sound allows both the visuals and the audio to explore more extreme possibilities while remaining mutually appropriate" (ibid). The possibility that what is diegetically appropriate in animation can be different from what is diegetically appropriate in live-action films, is according to Rowley, proof that "the notions of "diegetic appropriateness", while useful, cannot be used as the only marker of aural realism" (ibid).

Wells's comparison of animation film and live-action film on the basis of "realism" and with reference to how these two media deploy sound, only refers to similarities relating to their diegetic appropriateness. However, it is clear by considering Disney's first five features only, that non-diegetic sound is everywhere (Rowley). Also, sound is just one of the ways to label films as real. Animation films, such as Disney's, is filled with unrealistic acts and objects, for example, magical acts (boys turning into donkeys in *Pinocchio*), animals that can speak (*Bambi* and *Dumbo*), and moving inanimate objects (flowers and broomsticks in *Fantasia*) (ibid). Therefore, when considering realism in animation film, it can be said that Disney's films do not measure up as either being realistic, nor unrealistic. Rowley proposes that it is perhaps best to talk about Disney's cartoons representing a particular type of reality. Wells refer to "hyper-reality" and says that the depiction of characters, objects and environments are exaggerated in animation so that they move into "a realism which is simultaneously realistic but beyond the orthodoxies of realism" (24-8). Barrier believes that the best animated cartoons are those where fantasy and fact do not merely co-exist, but reinforce each other continuously (4).

In striving to produce the best animation features, Walt Disney and his team during the 1930s and 1940s continued to explore and experiment with story, characters, animation, technology, and music (Ghez 13). It is these studies and their many experiments that led to the development of the twelve fundamental principles of animation (Thomas and Johnston 47).

One of these twelve principles is known as "squash and stretch"[16] which best describes Disney's style for animating movement from around the start of the 1930s (Ibid; Rowley). This style, Rowley says, over-emphasises movement most notably "the way in which the body anticipates or reacts to movement" and is "a good example of animation exaggerating reality in order to create a greater impression of realism". This style of animation replaced "rubber hose" animation[17] which favoured fluidity of movement over its realism and dominated the silent era until the mid-1930s (Barrier 74). Disney animators studied live action film in great detail to discover the ways that bodies actually moved in order to better reflect it in their animation (Rowley). Sometimes live footage would be used as reference for a particular sequence and in other cases this extended to the use of the "rotoscope" (ibid).

Another principle of animation is timing, which refers to the period of time it takes for an individual action to take place (Webster 14). Timing helps objects appear to have a kind of realistic sense of weight and mass to them (ibid).

> One efficient technique animators use to keep the timing of their characters consistent is to time the walks or runs to the tempo of a metronome beat, i.e. 12 beats equals a step after every 12 drawings for a normal walk, and 8 beats for a fast chase scene. This was universally used by all the Golden Age studios; one notable example is its use in Hanna-Barbera's *Tom and Jerry* cartoons where the use of this technique was part of what gave the shorts their break-neck, but crisp timing. (Williams 110)

Because of the shift to more "realism" the actions animators had to create became more complicated (Thomas and Johnston 289). Initially animation comprised of repetitive dance steps and runs that easily could be made to follow the beat of the music, but had to start catering for humour and personality demanding that the acting match the tempo, too (Ibid). Disney's *The Band Concert* (1935) is such an example where well-known music with strong personalities and a situation played entirely in pantomime.

[16] Stretch and squash refers to act of defining the rigidity of mass of an object by distorting its shape during an action (Lasseter 90).

[17] The "rubber hose" style of animation was a solution to the stiffness of figures in early animation by conceiving their limbs as sections of a garden hose - without articulation (no hinged wrists or elbows) (Thomas and Johnston 45).

Early cartoons were simply drawn and mostly music driven, for obvious reasons; animation was an expensive medium and in order to remain profitable, the cartoons had to be produced and rushed out as quickly as possible with little time for refinement (Goldmark and Taylor 10). Using public domain music solved the problem of obtaining music, allowing song snippets to be quickly added and timed to the animation. This all changed with Disney's first fully-animated feature film with sound, *Snow White and the Seven Dwarfs* (1937), which brought a new level of importance to the way music was viewed in animation.

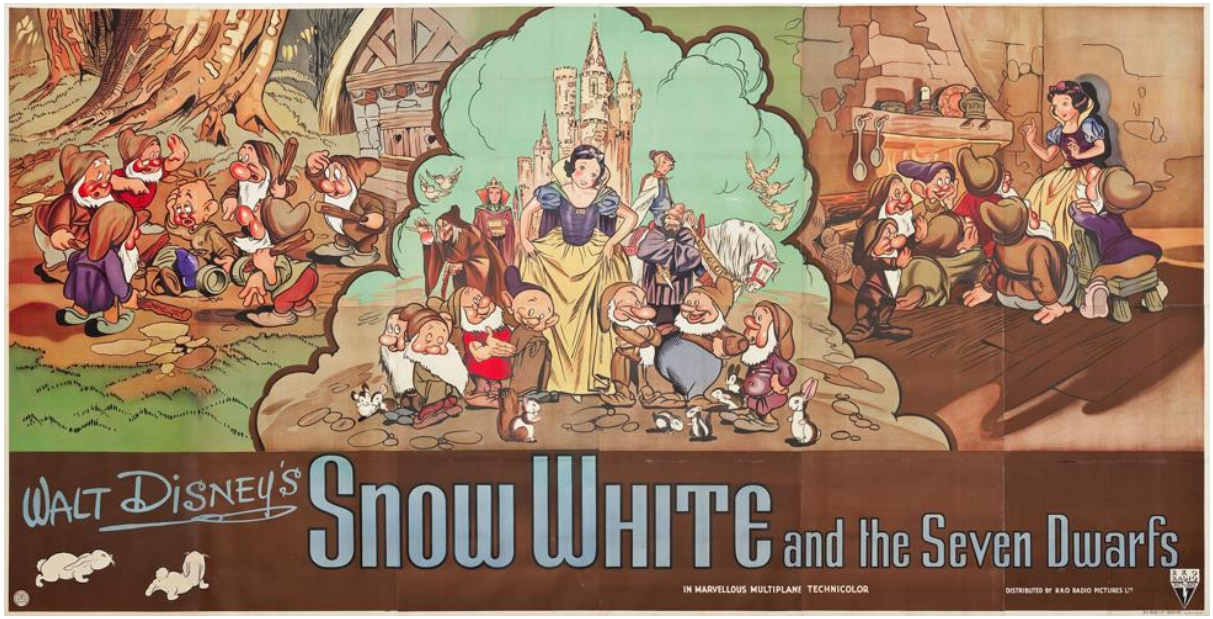


Figure 5: *Snow White and the Seven Dwarfs* (1937) – the first fully-animated feature film with sound. Digital image. Ford, Jacob. *1937: Snow White and the Seven Dwarfs.* Boy Meets Film, 5 Dec. 2015. Accessed 27 Aug. 2016.

The music in *Snow White and the Seven Dwarfs* (1937) was composed by Frank Churchill together with Paul Smith and Leigh Harline (Kaufman 90-3).

> Churchill and Harline were unquestionably Disney's major music men during the key period of the 1930s, and together they created what would become the signature Disney sound: music that is primarily melodic, inventively orchestrated, and essentially simple (sometimes deceptively so) and accessible, yet always with that indefinable X-factor that was another characteristic of Disney's work as a whole: popular appeal. (Goldmark and Taylor 24)

Since scoring music for sound films just started off during the 1930s, composers such as the one for *Snow White* had to pioneer their own style (Kaufman 90-3). Usually composers would use *leitmotifs*,[18] or themes for each character, to amplify the emotions of a character. In *Snow White*, the composers used different melodies each time the mood changed or the story progressed (Kaufman 90).

The early Disney features echo musicals in their handling of musical pieces to convey ideas, introduce characters, or in how they arranged the pieces of music (Rowley). *Snow White*, in particular, relies heavily on songs to carry the action: the introduction of the Prince, for example, is handled almost without dialogue (Altman 69). *Snow White* introduces most of its songs by starting off with short passages of rhyming dialogue (Rowley). In the context of realism it is interesting to note how purely "musical" the sound outside of the song sequences is (ibid). Sound effects are rarely heard, tend to be discrete and are less frequent than would normally be expected. Music is used in many instances to hide the absence of sound effects (ibid). For example:

> As Snow White looks down on the dwarfs' cottage she bends back a branch and releases it: there is no *swish* or creak of wood. She then proceeds with a host of animals to the cottage door, but there are no animal or woodland noises to be heard, only the lush orchestral score. When she does knock on the door, there is an appropriate sound effect, but after each of her two knocks, the sound effect is echoed by the orchestra, effectively creating a dialogue between diegetic and non-diegetic sound. (Rowley)

The soundtrack of *Snow White*, according to Rowley, shows how much variation from diegetic appropriateness can be sustained in animation without creating a readily apparent unreal effect. This was achieved by separating the image and sound and loosening the tight harmony of music and image that featured in so many of the Disney shorts. It is notable, Rowley says, that the substitution of music for sound effects is much less apparent in *Pinocchio*, *Dumbo*, and other later Disney features, where the sound leans much closer to full diegetic appropriateness. The loosening of expectations of aural realism in *Snow White* seems to have been less suited to the more elaborate and story-driven features that followed, which demanded a more conventional approach to aural realism (Rowley).

Other ways Disney used to create "realism" is 'rotoscoping'. Disney, however, was likely prompted to save time and money to re-use its rotoscoping, resulting in many identical scenes from one Disney

[18] Gorbman (26) defines a *leitmotif* in film as "any music – melody, melody-fragment, or distinctive harmonic progression – heard more than once during the course of a film". This music is associated with a cinematic object and recurs in order to evoke the memory of the viewer.

movie to the next (only the identity of the characters changes). In *Beauty and the Beast* (1991), the same dance movements can be seen in *Sleeping Beauty* (1959) and in *Robin Hood* (1973), the same dance movements can be seen in *Snow White and the Seven Dwarfs* (1937), *Jungle Book* (1967) and *The Aristocats* (1970). Most reused rotoscoped scenes were carefully selected musical scenes, implying it is more difficult and time consuming to animate to music.



Figure 6: Reused dance scene in *Beauty and the Beast* (1991) from *Sleeping Beauty* (1959). Screenshots by Author. Walt Disney Animation. "Walt Disney Recycled Animation Scenes #1." *YouTube*, uploaded by Movie Munchies, 13 May 2015. Accessed 27 Aug. 2016.



Figure 7: Reused dance scene in *Robin Hood* (1973) from *Snow White* (1937). Screenshots by Author. Walt Disney Animation. "Walt Disney Recycled Animation Scenes #1." *YouTube*, uploaded by Movie Munchies, 13 May 2015. Accessed 27 Aug. 2016.



Figure 8: Reused dance scene in *Robin Hood* (1973) from *The Jungle Book* (1967). Screenshots by Author. Walt Disney Animation. "Walt Disney Recycled Animation Scenes #1." *YouTube*, uploaded by Movie Munchies, 13 May 2015. Accessed 27 Aug. 2016.



Figure 9: Reused dance scene in *Robin Hood* (1973) from *Aristocats* (1970) – 'Duchess' and 'Thomas O'Malley' from *Aristocats* performing same moves as 'Maid Marian' and 'Robin Hood' from *Robin Hood*. Screenshots by Author. Walt Disney Animation. "Walt Disney Recycled Animation Scenes #1." *YouTube*, uploaded by Movie Munchies, 13 May 2015. Accessed 27 Aug. 2016.



Figure 10: Reused musical scene in *Robin Hood* (1973) from *Aristocats* (1970) – 'Hit Cat' and 'Shun Gon' from *Aristocats* performing same moves as musicians in *Robin Hood*. Screenshots by Author. Walt Disney Animation. "Walt Disney Recycled Animation Scenes #1." *YouTube*, uploaded by Movie Munchies, 13 May 2015. Accessed 27 Aug. 2016.

The close integration of music and action in the Golden Age forced animators to think more clearly and to be more organised in their presentation (Thomas and Johnston 288). While they have always been required to get across the story points economically, they never had to work strictly to the rigid pattern of a beat (ibid). The new relationship of music and animation added to the already existing challenges in animation:

> They now had to cope with a situation where the integrity of the music was more important and the action had to do the adapting. For example, when a classical music piece was used, the animators had to use it intact or the whole effect was spoiled. Considerably more work was required to find actions that fitted the music, told the story, and still built the character's personality. A move that was right, visually would seldom match the sound on the track at that point, and the animators had to become more like choreographers, trying to build a unified statement in movement rich in emotional content and with a cohesive flow – all within the confines of an established score. The visual material could not be choppy or fragmented; it had to have the same unity as the music. (Thomas and Johnston 288-9)

Fantasia (1940) was a bigger project for Disney than *Snow White* and followed the same principle using well-known excerpts of classical music (Thomas and Johnston 289). Walt Disney described *Fantasia* as a "film that would marry animated images with symphonic works into a concert of visuals and music" (Furniss, "Art in Motion" 90). It was the most ambitious project yet in working to pre-existing music (Thomas and Johnston 293). In *Fantasia*, most of the music was "free tempo" and did not adhere to a strict beat, which created awkward conditions for the use of the bar sheets (ibid).

All Disney films after *Fantasia*, according to Goldmark and Taylor, may be a reaction to the initial failure of *Fantasia* as Disney's most artistic film (32). This was the start of the end of an era for both Disney animation and Disney music, aided along by the poor reception of *Bambi* (1942), the animators' strike of 1941, and World War II (ibid).

The difficult post-Bambi 1940s were also the era of the "package" feature, i.e. "films consisting primarily of miscellaneous shorts and sequences strung together on a loose and often musical theme" (Goldmark and Taylor 32). With these features Disney aggressively shifted to popular commercial music (ibid).

After the three classic animated fairy tales of the early 1950s - *Cinderella* (1950), *Alice in Wonderland* (1951) and *Peter Pan* (1953), it was clear that Walt Disney's personal supervision of animation music decreased with his attention set on new endeavour such as live-action film, television and the Disneyland theme park, until the commercially successful Sherman brothers' era of the early 1960s (Barrier 273-4; Goldmark and Taylor 33-4).

The Golden Age ended in the late 1950s when MGM, UPA, and other studios halted cartoon productions and a musician's strike forced studios to use library music from past cartoons (Goldmark and Taylor 10). In addition, television in the 1950s demanded large volumes of cartoons forcing other studios to put out cheap and hurried work (ibid).

Some milestones were nevertheless achieved during this time. In 1957 Warner Brother Studios produced the short film *What's Opera, Doc?.* An earlier cartoon *Herr Meets Hare* (directed by Friz Freleng in 1945) was a significant precursor to *What's Opera, Doc?,* produced by world famous animation director Chuck Jones (Goldmark, "Tunes for 'Toons" 146). The entire soundtrack for *What's Opera, Doc?* was recorded before animation began. Recording the singing parts in advance is a necessary step in any cartoon, because the animators must synchronise the mouth movements of each character to the final vocal tracks. Jones, however, took this concept a step further by requiring that all the music be in its final form for the animation to proceed so that at all times the characters could move in a choreographed fashion (ibid). Ever vigilant about realism in portrayals of performances such as singing and dancing, Jones and his animators observed and sketched ballet dancers while rehearsing (ibid). Rather than precisely copying the movements of the ballet dancers by rotoscoping them, they instead relied on their studies to create a more natural and flowing duet between Bugs Bunny and Elmer. In the process, they steered clear of *Herr Meets Hare*'s farcical dance.

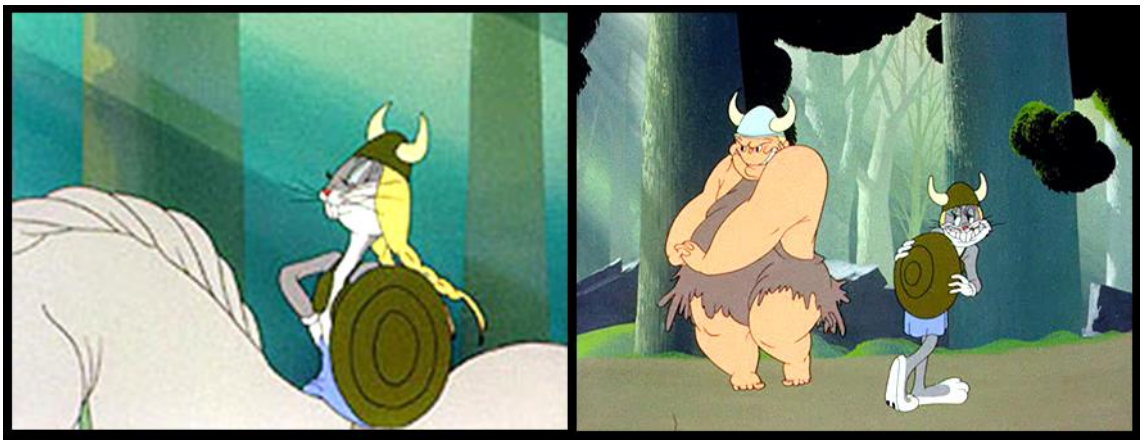


Figure 11: Bug Bunny's (in drag) entrance and farcical ballet sequence in *Herr Meets Hare* (1945) to the tunes of "Pilgrims' Chorus" from the opera "Tannhäuser" by Richard Wagner and "Die Fledermaus Overture" by Johann Strauss II. Screenshots by Author. Warner Brothers. "Herr Meets Hare Bugs Bunny." *YouTube*, uploaded by Annie Renault, 5 Jul. 2014. Accessed 29 June 2016.



Figure 12: Bug Bunny's (in drag) entrance and more realistic ballet and singing sequence in *What's Opera, Doc?* (1957) to the tunes of the operas "Tannhäuser" ('Pelgrim's Chorus' and 'Return my love' arranged by Michael Maltese) and "Der Fliegende Holländer" by Richard Wagner. Screenshots by Author. Warner Brothers. "What's Opera, Doc." *YouTube*, uploaded by Peter Dunster, 15 Feb. 2013. Accessed 29 June 2016.

In the 1960s Disney-supervised animated features continued to impress with their scores (Goldmark and Taylor 34-5). However, Walt Disney's death on December 15, 1966, marked the end of an era for the Disney studio (ibid). Even though Walt Disney's last supervised film, *The Jungle Book*, was a commercial success, "Disney's death and the ensuing absence of strong creative leadership threw the studio, and particularly the animation department, into a creative limbo from which it did not really emerge until the late 1980s" (ibid). In 1989 Disney Studios launched a series of Broadway-style musical extravaganzas that revived both the animated feature and Disney's reputation as force in popular music (ibid). The cycle peaked early with *Beauty and the Beast* (1991) and *The Lion King* in 1994 which

enabled Disney to successfully enter the live Broadway theatre arena with these two successful productions still running to this day (Goldmark and Taylor 35-6).

The cel animation technique remained the dominant form of animation production in cinema until the advent of computer animation. Disney's traditional 2D musical animation productions evolved through several technological and compositional periods and are well-known for their ability to combine music and imagery to tell a powerful story (Coyle 11; Beauchamp, "Designing Sound 1st Ed" 45).

The transition from traditional 2D to 3D computer animation meant that the animator's traditional task of redrawing and repainting the same character 12 times a second (for each second of finished animation) has now been replaced by the modern task of developing dozens (or hundreds) of movements of different parts of a character in a virtual scene (Parent 15). This necessitated the introduction of many additional positions making the animator but one component of a very long and highly specialised production pipeline.

Beauchamp details the contemporary production path for animation which consists of three stages: preproduction, production and post-production ("Designing Sound 1st Ed" 139-40). It is in the preproduction stage where the initial decisions about music are taken with the drawing up of the storyboard. Thereafter, the music is recorded and incorporated in the animatic[19] for timing purposes (127-38). Animators during the production stage not only start the process of making characters move, but also perform motion tests, using a temp track, to reveal animation problems (140).

Beauchamp's account of deploying music in the production process implies that character animators should preferably receive pre-recorded sound, which can include source music, in digital format at the beginning of the animating process as part of the animatic or planning documents. However, little is known about the specific processes and tools contemporary character animators receive and use when animating to music which represents a gap in the historical overview of animating-to-music after the Golden Age.

[19] The animatic is a video storyboard that serves as a blueprint for the animator indicating how long the separate actions contained in the different scenes will take (Webster 141; Beauchamp, "Designing Sound 1st Ed" 132).

1.4 Treading new ground in integrating music and animation – the ultimate goal

From literature it can be seen that various terms were coined to describe this constant struggle towards the best possible result in animation. When assessing the aesthetics of animated works, for example, Furniss uses the term *mise-en-scène* meaning 'staging an action' and first applied to the practice of directing plays (Bordwell and Thompson 169 in Furniss, "Art in Motion" 61). "Since part of the appeal of animation lies in the illusion that inanimate objects have 'come to life', it is understandable that many people have considered continual, fluid movement to be of central importance to animation aesthetics" (Furniss, "Art in Motion" 78). Even though there are many considerations in designing animated imagery, animation students focus their education and art background on the development of characters and the means of creating movement. Furniss stresses that while an attractive *mise-en-scène* is impressive, an audience is likely to lose interest unless attention has been given to other aspects that can provide a sense of overall unity, such as when sound making characters 'come alive' to the beat of music (80).

Powell, when talking about the 'composed film', also considered music as one of those important aspects of film that had to work together with colour, lighting, staging, movement and so forth towards a single expressive end (Moor, "Gothic Riots" 1). The 'composed film' refers to the process in filmmaking where the footage is timed to the second to match the pre-recorded music. This study suggests the use of Powell's ideal of the 'composed film' as motivation for seeking a more coherent approach to animate to pre-recorded music.

An important concept in the process of seeking a more coherent approach, is what Christopher Small calls 'musicking', which means "to take part in any capacity in a musical performance whether by performing, by listening, by rehearsing or practicing, by providing material for performance (what is called composing), or by dancing" (Small 9). This study argues that character animators are in effect 'musicking' when animating a musical performance. In character animation there are many examples of effective synchronisation between aural and visual elements, but 'musicking' should not be viewed in the same light as its sometimes pejorative term, 'mickey mousing'.

Animation, in its most inclusive definition, is a visual method for representing motion (Coyle 3). However, the word 'animation' comes from 'animus' which means 'life or to live'. Making it move is not animation, but just the mechanics of it. According to Milt Schaffer, animation is more than entertaining the audience with funny little movements in sync to sound (Thomas and Johnston 146).

To bring a character to life, it is necessary to instil in the character an attitude that reflects what he is feeling or thinking or trying to do (Thomas and Johnston 146). The concept of instilling life in characters requires the animator to find himself living inside the character - being there.

A relatively recent animation feature, *Final Fantasy*, according to Beauchamp, appeared to be driven towards realism; however, most animation does not strive towards this goal. Instead, each animation develops its own sense of reality based more on internal logic than subscription to the laws of the physical world ("Designing Sound 1st Ed" 21). Plausibility or believability rather than realism remains a strong aesthetic principle in animation (ibid). When believability is effectively established, the audience will willingly suspend their disbelief of technical concerns and maintain their involvement with the narrative.

In the context of promoting the animation of the performance of characters to be more precise in line with Powell's ideal, this study supports the drive towards animating more believable actions. This is achievable if the character animator is able to 'live inside' the character.

1.5 Conclusion

When looking at the historical development of animating to music it is clear that there is a need for research that from an animation perspective, will advance the deployment practices and processes for integrating film music and animation. Despite the many publications on the various experimentations of this new language, especially during the Golden Age of American animation, little is known of the specific production processes and tools character animators use today to animate to music. It seems as if today's 3D character animators are merely developing working practices as a response to new technologies (an 'outside' force) and do not realise the value of past practices and what they can learn from them. This study suggests that having a certain musical competency set will enable character animators to animate the performance of characters more precisely (Powell's ideal of the 'composed film') to make their actions more believable. In the next chapter the musical competencies relevant for character animators will be explored. The need for animators to learn more about music will be investigated, and an ideal musical competency set for character animators will be compiled and presented.

Chapter 2:

Musical Competencies for Character Animators

2.1 Introduction

Animation can be defined by various techniques and thus, according to Furniss, a simple definition may no longer be possible ("Art in Motion" 5). Furniss adopts the Scottish-Canadian animator and filmmaker Norman McLaren's definition of animation describing it as 'the art of movements that are drawn' as opposed to 'the art of drawings that move' (ibid). McLaren expanded his definition by stating that "animation is the art of manipulating the invisible interstices between frames" (McLaren in Solomon 11). Therefore, it is clear, that to McLaren it is not the individual creation of a frame of animation but more the decisions that are made between each frame which more accurately defines the animator's art (Wells, "Animation: Genre and Authorship" 7). In this study, it is this space between the frames that is closely observed, focusing on the creative process undertaken in producing the animation. Particular attention is paid to the meaning suggested by time-based-manipulation and its product, i.e. movement that fits music, created within this space.

Blatter argues that since dance is the movement of the body, all human motion is dancelike and therefore potentially related to music (27). Both music and animation have movement (gestures unfolding over time) as a common element. Animators, just like dancers, carve out movement in time, using rhythm and space and utilise motion to enhance the stories, delineate characters and communicate moods and emotions (Aloff 11).

Chuck Jones said that the most important truth he learned about animation is that it is the art of timing (Bendazzi 14). John Lasseter reiterates this by stating that timing gives meaning to movement and is the essence of an animation (Lasseter in Whitaker, Halas and Sito IX). "Appropriate timing of an action establishes the idea behind the action as well as the audience's interpretation of it" (ibid). According to Whitaker et al, "timing should reflect the weight and size of an object, convey a character's thought process and emotions, and strengthen story points" (ibid).

Music, according to Blatter, is "characterised as a temporal art" (1). Since time is also very important in animation, both animation and music can thus be seen as temporal arts. Whitaker, Halas and Sito add that music and animation has a relationship in two ways. Firstly, both elements have a basic mathematical foundation and move forward at a determined speed (i.e. timing), and secondly, since

animation is created manually frame-by-frame, performances such as dancing can be fitted to music in a very exact manner (133).

Laura Cull examines the "arithmetic of rhythm" (240) by considering Gilles Deleuze's notion of looking at dance in terms of miniscule movements affected by kinetics. Here the body is a performance tool, which can react with or against physical laws. The body is not moving alone, however, as the movements around the body must also be considered. As Cull notes:

> ... the intersection between the productive components of a movement simultaneously produces the expressive form of a step, but also a continuous emerging difference in between the steps; harmonic precision and subtle definition being the effect of chaotic subterranean jittering, trembling and proliferation of movements in all directions. (Cull 244)

Cull suggests (after Deleuze), just as McLaren who talks of what is 'between the frames' of animation, that there is much to examine between the movements of dance. This is, according to Cull, where the performance is being constructed and, by using the body in this way, suggests that essentially the dance choreographer (or animator if it is the same person) can be compared to a puppeteer manipulating the body (247). In this research the focus is on the animator manipulating the character to music.

According to Furniss one of the biggest differences between amateur and professional animation lies in the way that sound is employed ("Art in Motion" 83). The secret to successful animation, Furniss says, is the care with which aural elements – voices, sound effects and music – have been handled (ibid). Although some studios have set up training courses, for example courses to train artists to understand the mechanics of real life and animated movement (Furniss, "Art in Motion" 78), all too often students studying animation do not sufficiently value sound as an important aspect in animation (Webster 181). This can be due to the complexity of animation and that not all animation films contain musical scenes.

Continuous learning is indispensable for professionals, like animators, highlighted by the many continuing professional development initiatives available online. In this chapter, the reasons why the learning efforts of animators should also include basic musical competencies is explored from the perspectives of both past and present day animators. This discussion culminates in a set of basic

musical knowledge and skills that, I propose, could assist character animators to more successfully deploy music in animation.

2.2 The value of having musical knowledge from the perspective of past and present day animators

Individuals who are attracted to the field of commercial animation typically focus their education on the development of characters and the means of creating movement. Artists who excel in these aspects of animation might find they know less about issues of sound and musical structure, which also are key ingredients in making an animated production a success (Furniss, "Art in Motion" 80). Unfortunately, despite its importance, students studying animation are not sufficiently exposed to the topic of sound in animation (Webster 181) perhaps due to sound design being a field on its own.[20]

In Beauchamp's view, courses addressing sound for image are often absent from animation curricula, in Beauchamp's view, because of competing forces. The relatively low cost of essential technologies, for example, has opened the door to an increasing number of animators. Academic programmes have emerged to meet the growing interest and demands for formal instruction in this art form. Those responsible for designing curricula face the daunting task of compressing essential animation courses into a traditional four-year programme of study ("Designing Sound 1st Ed" xix).

While animation studios such as Disney and Pixar invest in training their animators in terms of drawing skills and acting classes, it could be argued that they should also be trained in the rudiments of music.

There is evidence that many of the earlier animators indeed had some musical competency. Wilfred Jackson, as mentioned before, had a basic knowledge of music (Thomas and Johnston 287), while Frank Thomas's advice was regularly sought on music during the development of feature films at Disney (Thomas and Johnston 174). Walt Disney himself was said to have had a musicality which inspired not only a musical orientation in the animation film up to his death, but also informed the animation style and lucrative merchandising strategies evident in David Tietyen's *The Musical World of Walt Disney* (1990).

[20] Although there are many courses on sound design for film, an investigation into the curricula of universities and training providers in South Africa revealed that very few animation courses include a musical component.

Luigi Allmano, formally trained in both music and animation, found a photocopy of the original Fleisher Studio's Operational Procedure that was handed out to animators (National Film Board of Canada). This book contained tips as well as rules and regulations they could follow when animating. One of the chapters in this book is called 'Animation as related to Music' and, according to Allmano, contained the following facts: earlier animators determined the tempo of the music, so they decided how quickly and slowly Bimbo walked. They gave this information to the composers to use to compose the music so that everything could be synchronised when they got to the recording stage; animators were assumed to have a basic musical knowledge (especially knowing about rhythm and tempo); and in addition to the stopwatch, animators used a metronome to establish the tempo and rhythm when animating.

These animators had to build a natural sense of rhythm into their way of thinking so that when they animated and they timed out their drawings they would be sure to stay in sync with whatever the composers were doing (Allmano in National Film Board of Canada).

Even though the metronome technique is generally disregarded by modern animators as predictable and clichéd, saved for use in musical sequences, some animators such as Genndy Tartakovsky, Danny Antonucci and John Kricfalusi still use this principle (in the form of digital BMP (beats per minute) clicks) and in any context they wish (TVTropes). It is believed that it can help the animator to not only plan out their animation or even the entire cartoon, but enhance the feeling and mood of it in motion, thus giving it a sensible structure (ibid).

In describing this process, Canadian animator John Kricfalusi (better known as John K.), who created *The Ren & Stimpy Show* and founded animation company Spümcǿ, says:

> I time all my cartoons to musical tempos like the directors did for the classic cartoons of the 1930s to the 50s. They used to write the timing on musical bar sheets that are marked off in beats and bars. In the timelines of most animation programs you don't have any way of seeing the overall structure of your timing as you do in music or old time cartoons. Instead you just have a long timeline with hundreds or thousands of individual frames - which is very hard to read. It would be like having a yardstick that is only marked in 16ths of an inch and you had to keep track of 576 increments. Timelines in animation programs are incredibly primitive. (Usesthis)

Notably, numerous reputable, prominent, and well-known animators were and are musicians, singers and/or composers (Ranker).[21] Stephen Melagrano, Adam Strick and Jacobs Gardner are three DreamWorks animators who are all also involved in music. According to Melagrano: "I've also found it very common for animators to be musicians as well".

In an interview in which he shared his love of animation and talked about the fun he had working on Pixar's *Piper*, Adrian Belew, well-known American musician, songwriter and record producer, remarked that "so many people involved in animation are musicians. There's a huge overlap because of the issues of rhythm, timing and movement over time" (Sarto).

Over the years Carlos Baena, who is mostly known for his animation work through the characters 'Luigi' and 'Guido' from *Cars* and 'Skinner' from *Ratatouille*, learned how important music is for animation and how close the one is to the other. Animation, according Baena, is similar to music from a timing/texture and rhythm point of view. As he learned more about musical terms he found their equivalent in animation; tempo, beats, accents, phrase, rhythm, legato, staccato, adagio, presto, finale, monotone to name a few are all terms that can be applied to animation in some way (Baena). By watching films like *Fantasia*, he says, one can perceive how the music injects character and personality into the film and its characters. According to Baena some of his favourite animation/acting shots have always had a musicality to them such as *The Jungle Book* and *Nightmare before Christmas*.

By assuming that animators also need to know about music, the question may arise: what are those musical competencies that character animators should acquire that will benefit them in animating performances to music?

[21] Some of the reputable, prominent, and well known animators from the past and present who are also musicians, singers and/or composers, are: Seth MacFarlane (actor, animator, cartoonist, writer, producer, director, comedian, singer and songwriter); Matt Stone (actor, animator, singer, songwriter); Trey Parker (animator, singer, songwriter); Matt Groening (animator, musician, cartoonist); Mike Judge (actor, animator, musician); Georgia Hubley (film score composer, musician, animator, voice actor); William (Bill) Hanna (film score composer, director, producer, film screenwriter, saxophone player); Butch Hartman (animator, score composer); Dennis Greenidge (singer, animator); and John A Davis (composer, actor, animator) (Ranker).

2.3 An exploration of the ideal musical competencies for character animators

Animators might not always realise that they already know and are using concepts that are also found in music. The most important one of these animation concepts that is equally important in music, is the concept of timing. As discussed earlier, musical timing works in parallel to performance timing in animation. In music, time is organised by an underlying pulse also called the beat (Blatter 13). According to Glebas, music has a flow and pace determined by the beat (although music can sometimes have no discernible pulse, or be played without a strict tempo, e.g. *rubato*, *accelerato*, *decelerando*, *liberamente*, etc.) (84). Musicians perform according to beats per minute, so do animators when animating a character's movements to music, particularly in dance sequences.

Despite being already familiar with certain musical concepts which also exist in animation, character animators animating to music can also benefit from acquiring other musical competencies relating to musical terminology and knowledge of basic musical notation or theory. Beauchamp identifies certain elements of music and their implication for image in animation to control the audience's experience, such as melody, harmony, tonal music, atonal music, rhythm, dynamics, instrumentation and style ("Designing Sound 1st Ed" 44).

The elements of music that I feel character animators can potentially benefit from will be discussed below.

2.3.1 Musical aspects of sound: pitch, duration, loudness, melody, harmony, texture and timbre

Blatter defines music as "the art of sound" and that it consists of aspects such as pitch, duration, loudness, melody, harmony, texture and timbre (1). Knowing about these musical parameters can also have value for animators. For example, Furniss, in emphasising the aural elements in animation, states that acoustic properties such as loudness, pitch and timbre can all produce meaning in a motion picture ("Art in Motion" 84).

The pitch parameter of music refers to the frequency (highness or lowness) of a sound indicated by the placement of notes (pitch symbols) on a staff (the horizontal lines on the music sheet on which the notes appear) (Blatter 2). Duration is the length of the sound and indicates how long a note or a rest lasts. The relative strength of the sound is called loudness, i.e. how loud or soft a sound is.

(Loudness and the notation of pitch and duration will be discussed in greater detail in the next sections.)

A melody, in simple terms, is a sequence of single notes arranged in such a way that it forms a satisfying whole. In musical terms, a melody is the element that focuses on the horizontal presentation of pitch (Blatter 2). Melodies can be derived from various scales (families of pitches) such as the traditional major (usually associated with a more upbeat feeling) and minor scales (associated with a sad or melancholy feeling) (Western Michigan University). In animation, melody can help support narrative elements, especially when used as a leitmotif (Beauchamp, "Designing Sound 1st Ed" 44).

Harmony (often thought of as a vertical aspect of music) can be defined as notes that sound simultaneously and support a melody (Chouiniere). To harmonise a melody, accompanying notes such as a countermelody or chords are added (ibid). A countermelody is a secondary melody that usually accompanies the primary melody on a higher- or lower pitch. The rhythm of the secondary and primary melodies can be the same. Chords are formed when three or more notes are played at the same time. Harmony elicits emotional responses and can inspire the character animator to portray a specific mood in animation (Beauchamp, "Designing Sound 1st Ed" 44).

Timbre (also called tone colour or tone quality) is another aspect of sound. Although not a fundamental component of sound, it is the result of complex interactions between various pitches, durations and loudness over time (Blatter 1). If a listener hears two different instruments like a piano and a violin play the same note at the same volume for the same length of time, that listener would be able to easily tell the difference between the two instruments because of the difference in timbre. Two trombones, for example, may also have a different colour from one another because a trombonist is able to some extent to alter the timbre of the instrument in a piece. When analysing a musical piece's timbre, an animator can identify different instruments by ear.

2.3.2 Fundamental rhythmic aspects for animators

Rhythm in music is the grouping of notes of different lengths to form certain beats (Blatter 15; Glebas 85), while rhythm in animation refers to frames per beat (Maestri). Rhythm can assist the animator with correctly timing the actions of the character and influence the audience's perception of the pacing of the scene (Beauchamp, "Designing Sound 1st Ed" 44). Rhythm can also be associated with the feeling the animator wants to convey.

Tempo is similar to pacing in animation (Baena). Tempo is the speed at which music is performed (the speed of the beat); it provides the pulse and drive (Alten 348; Blatter 13). A quick tempo tends to intensify stimulation, while a slow tempo tends to allay it. Glebas describes tempo as how often you tap your foot to the music (85).

To learn the basics of rhythm, earlier animators at Fleisher Studio used the following method:

> For one tap to a beat, they said the word 'chair' to every beat; for two taps to a beat, they said the word 'table'; for three taps to a beat, they said the word 'regular'; and for four taps to a beat (a sixteenth note), they said the word 'pitter-patter'. For example, by keeping the metronome at 60, they gave a character's walk a triplet or 'swing' feel by repeating the word 'regular', and to give a character a high-speed walk with a 'tiny step' feel they repeated the word 'pitter-patter'. (Allmano in National Film Board of Canada)

The following is a method that can be used to determine the rhythm in animation (i.e. to calculate the amount of frames per beat) that is still used by animators today (Maestri):

> Firstly one needs to calculate the beats per minute (BPM) of a rhythm by, for example, using a watch and counting the number of beats in six seconds of music then multiply the number of beats in six second by 10 to get the beats per minute (BPM). By taking the BPM an animator can now determine how many frames are needed per beat of music. For example, if the BPM is 120 (a standard BPM) and there are 24 frames per second (fps), the frames per beat can be calculated as follows:
>
> 24 fps x 60 seconds = 1440 frames per minute (fpm)
> 1440 fpm ÷ 120 BPM = 12 frames per beat

Various digital applications are also available to easily calculate the beats per minute of any sequence of music, such as BPM Detector, BPM Counter and BPM Tap.[22]

[22] These applications can be downloaded from the App Store for Android or Apple phones.

2.3.3 Musical terminology

Musical terminology can be divided into three groups, namely terminology pertaining to tempo, dynamics, and mood. The Italian language is the source for many terms used in western art music, and often seen on pieces of printed musical notation or scores (Blatter 13). Even though character animators seldom work from a notated score, musical concepts remain useful for them, as argued in this study. Unfortunately, music composers on animated films tend to compose directly into digital audio workstations like ProTools, or Logic Pro, with the production of notated scores occurring, if at all, only at the point of getting musicians in to perform and record the music. For the proposed notation presented in Chapter 4, knowledge of musical terminology is required.

Tempo is indicated in music by words or by metronome marks (Blatter 14). The word 'Allegro', for example, indicates that the piece should be performed at a fast tempo and usually appears at the top left side of the sheet music. A metronome mark, always indicated in brackets, consists of a pitch symbol (e.g. a half note or a quarter note) and a number indicating the beats per minute (Blatter 13).
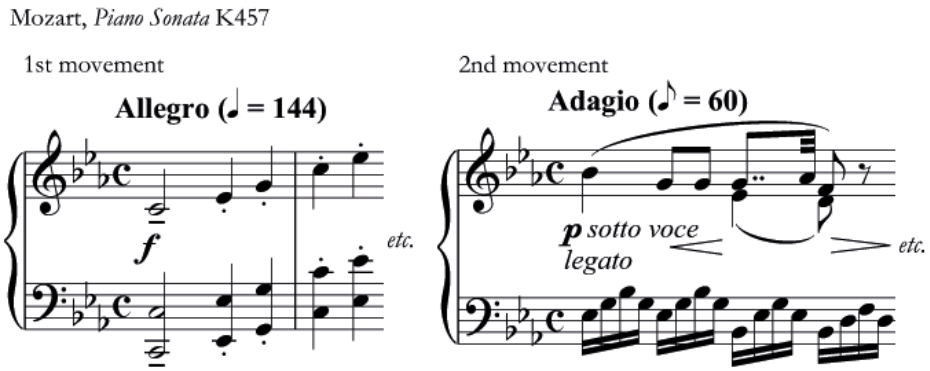


Figure 13: Tempo indicators on two different music sheets – the Italian term, and the metronome mark alongside it. Digital image. Clements Theory. "Tempo: Fast and Slow." *Clements Theory*, N.d. Accessed 23 Sept. 2016.

Knowing the terminology for the tempo of the music will assist the character animator to determine the speed of the movements in a scene. (In the case of the animator receiving the audio track rather than the music notation, the animators will most likely use the exact BPMs, and possibly even a 'click track' – an audio file consisting purely of metronomic pulses – instead of the musical term relating to tempo to determine the speed.)

Dynamics relate to the loudness of a piece and are useful for emphasis or gradual changes in intensity (Blatter 30; Beauchamp, "Designing Sound 1st Ed" 44). The terms to indicate the dynamics of a music

piece are usually placed below the staff at the place where the performer should play loud or soft. The term 'piano', for example, indicated that the performer should produce soft sounds, while the term 'forte' indicates that the performer should produce louder sounds (Blatter 30). The Italian word 'mezzo' means half. In music the term 'mezzo' can be used alongside the term 'forte' to indicate that the performer should play half loud. The dynamics are usually indicated on sheet music in their abbreviated form, for example, ***f, mf, mp*** and ***p***.

Dynamic Sign	Italian	English
ppp	*pianississimo*	Very, very soft.
pp	*pianissimo*	Very soft.
p	*piano*	Soft.
mp	*mezzo piano*	Moderately soft.
mf	*mezzo forte*	Moderately loud.
f	*forte*	Loud.
ff	*fortissimo*	Very loud.
fff	*fortississimo*	Very, very loud.

Figure 14: List of words and their abbreviations indicating dynamics on a music sheet. Digital image. Rose, Teresa. *Reading Music Lesson #47: Dynamic Signs*. Music Reading Savant, 8 Nov. 2014. Accessed 23 Sept. 2016.

The dynamics will inform the character animator of the scale of the movements the character needs to make, for example, when the music is very loud (*fortissimo*) the character will not normally make small movements unless it is done on purpose.

Mood describes the way or feeling with which a musical piece should be performed (Blatter 14). The terms indicating the mood communicate a sense of tempo. For example, it can indicate that the piece should be played with life (*animato*), sadness (*dolore*) or gracefully (*grazioso*) (Blatter 14). These terms are usually indicated at the beginning of the piece below the first staff.

Italian musical term for Mood	Meaning
Con Brio	With brilliance; fire
Con Grazia	With grace
Con Spirito	With spirit
Dolce	Sweetly
Expressione	With expression
Grandioso	Grandly
Maestoso	In a majestic style
Morendo	Dying away
Presante	Heavy; deliberate
Sostenuto	Sustained; broaden out
Tranquillo	Quiet; tranquil

Figure 15: A list of Italian musical terms describing specific moods. Quizlet. "Music Terms – Mood and Feeling." *Quizlet,* 23 Sept. 2016. Accessed 23 Sept. 2016.

The character animator can use the mood terminology to ensure a proper fit of the character's movements to the mood of the music.

Except for knowing and understanding the three groups of music terminology, an animator should also understand basic music notation of pitch and duration.

2.3.4 Basic music notation of pitch and duration

Music notation is a system that is used to visually represent what is heard when music is performed by an instrument or the human voice and gives musicians the information they need to play the music as the composer intended it (Schonbrun xi). Character animators can benefit from knowing notation of pitch and duration so that they know when to animate what action and for how long to fit the music.

Basic music notation of pitch is placed on a staff which consists of five parallel horizontal lines (Blatter 3).[23] The higher up the note on the staff, the higher the sound, and the lower down the note on the staff, the lower the sound. In orchestration, each instrument has its own staff on which their specific notes are placed.

[23] This modern staff notation system developed from the western art music tradition. There are other music notation systems for other musical traditions such as ancient notation systems found in the near East, ancient Greece, etc. Indian, Korean and Indonesian notation systems are still very much in use.

A clef is a symbol that shows the reader which pitch will be assigned to which staff line, usually found at the beginning of the staff (Blatter 4). There are three clefs: The G clef, the F clef and the C clef.

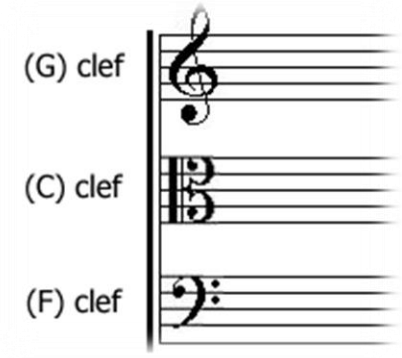


Figure 16: The G clef, the F clef and the C clef symbols as it appears on a music sheet. Digital image. Guitar Alliance. "Music Theory 101, Course Outline, Chapter 1: Music Notation – Part II (Pitch: Staff, Clef, and Ledger Lines)." *Guitaralliance*, 2010. Accessed 23 Sept. 2016.

Basic music notation of duration is communicated by the appearance of the symbol or note that is placed on the staff to indicate the pitch (Blatter 9). The longest duration is a whole note. It is the only note without a stem (the vertical line attached to the circle). The half note is half the length of a whole note, and a quarter note half the length of a half note, etc. (Blatter 9). A small dot next to the note indicates that the note should be kept for its original duration plus half of its duration.

Silence in music is deemed as important as sound and it is fundamental to indicate how long the silence should last (Blatter 11). The silence is indicated by rests that also differ in length. For every pitched duration (note) there is an equivalent silent duration (rest) (Blatter 11).

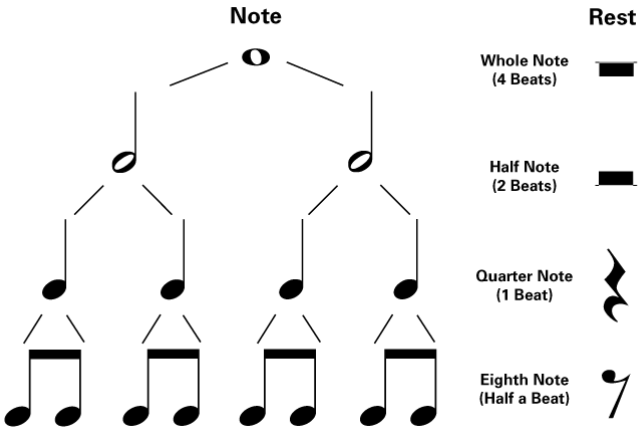


Figure 17: Diagrammatical explanation of some note and rest values. Digital image. Learn to Play Music. "Free Beginner Piano Introduction." *Learntoplaymusic,* 2015. Accessed 23 Sept. 2016.

All the duration indicators (notes and rests) can be used in conjunction with one another to create various rhythms as indicated in the figure below.

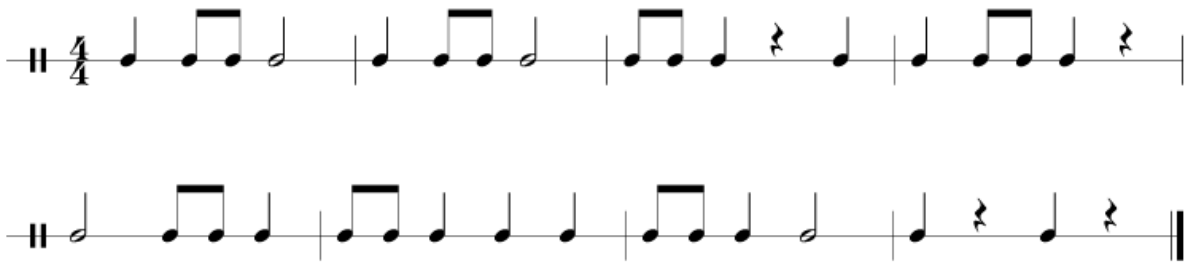


Figure 18: Different rhythmic patterns created by using varying note lengths within a 4/4 beat. Digital image. Crafton, Don. *Integrating SightReadingFactory.com into your elementary music curriculum.* Sightreadingfactory, 21 Feb. 2015. Accessed 23 Sept. 2016.

Notes of different lengths are grouped and separated into smaller groups by bar lines (Blatter 15). Bar lines makes it easier for the reader of the music to visually understand how the notes are grouped together. Within a group or between two bar lines (called a measure) there will always be a set amount or number of beats. The number of beats is indicated by a time signature which is expressed as a fraction at the top of the stave (Blatter 15). The upper number is the number of beats in a measure. The bottom number simply defines the length of the beat (Glebas 85). It is always a 2, 4, 8, 16 or 32 and these refer to musical times of a whole note. A whole note has two half notes, four quarter notes, etc. For instance in the image below the first time signature (4/4) indicates that there are four beats of quarter notes/rests in the first measure, whereas the fourth time signature (6/8) indicates that there will be six beats eight notes/beats in a measure. The beats may also be indicated by a rest instead of a note.

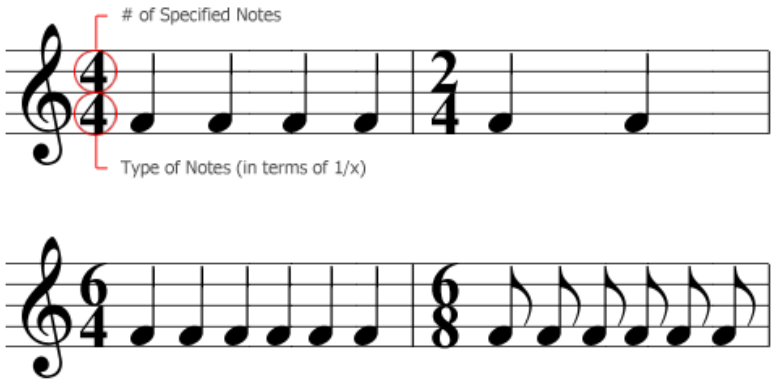


Figure 19: Examples and explanation of time signatures. Digital image. StudyBlue. "Music Theory Chapters 1 to 3." *Studyblue*, 2 Sept. 2016. Accessed 23 Sept. 2016.

The beat of the music is easily measured, since beats are fitted into bar units of defined time lengths and are interpreted in time units. Bars can contain various numbers of beats and these must be measured to the film frame. Having done this, it is comparatively easy to fit the animation to the speed of the beat and find the right type of movement to follow the music (Whitaker, Halas and Sito 133).

Although music is much more complex and music theory can be explained in greater detail, this basic musical knowledge is proposed to be sufficient for character animators animating musical scenes to music.

2.3.5 Weaving the different musical aspects and terminology

The musical sheet for 'Allemande'[24] composed by CM von Weber (1786-1826) is presented below to illustrate what musical aspects and terminology character animators can find on a sheet of music and what these aspects and terms mean.

[24] Allemande is a prescribed composition from the 2002 Unisa (University of South Africa) Grade 2 syllabus for piano in the Romantic category.
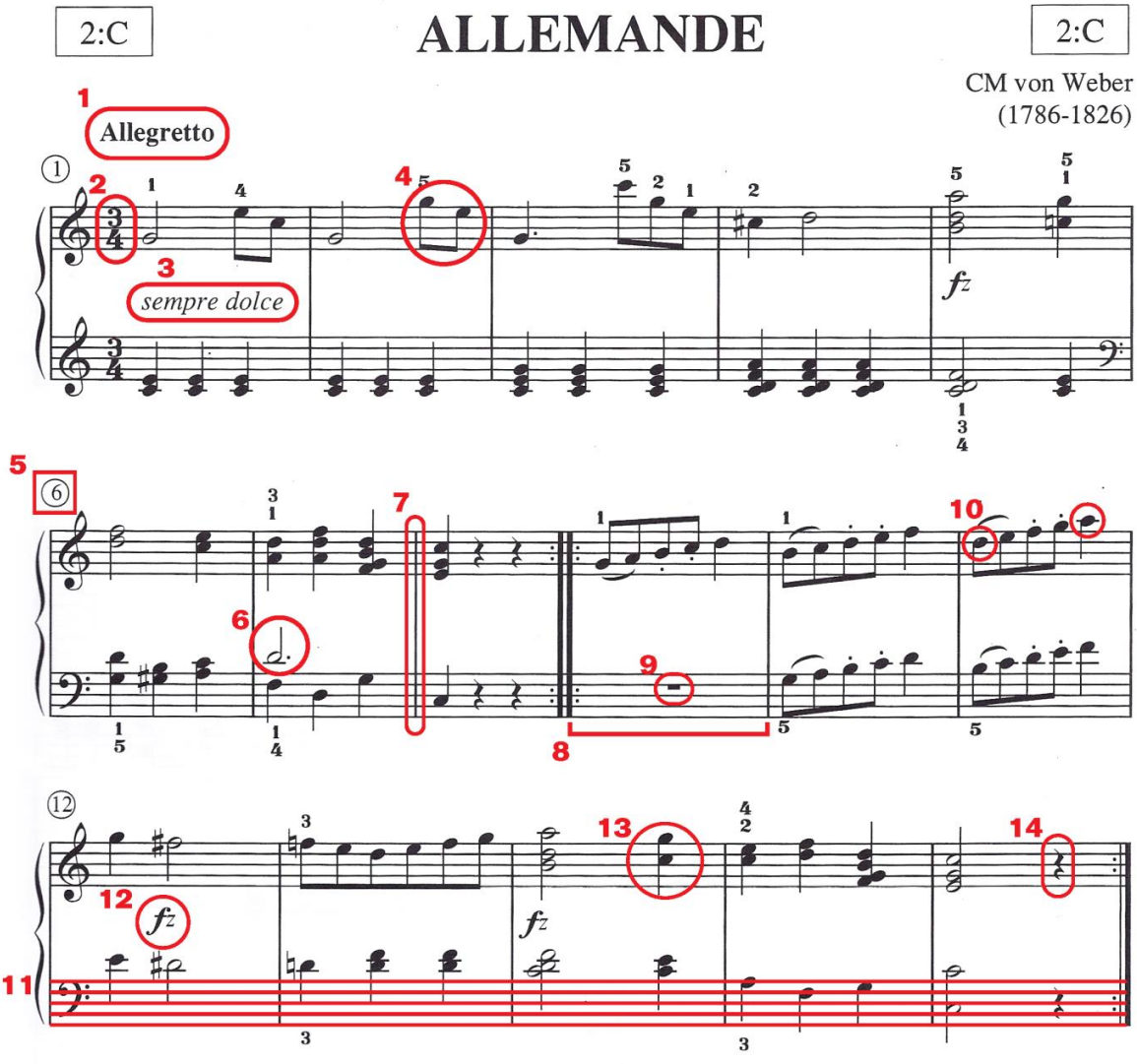


Figure 20: 'Allemande' sheet music with indicators for explaining musical terms and notation. Edited and modified by Author. UNISA (2001). *Allemande – by CM von Weber (Original work published 1801).* UNISA Grade 2 Piano Examination Album 2002 until further notice. Pretoria: University of South Africa (UNISA). Print.

These are the explanations of musical terms and notation as indicated on the sheet music of 'Allemande':

1. This is the tempo for the piece. In this case the piece should be performed 'Allegretto' which means moderately fast - not as fast as 'Allegro'.
2. The time signature is 3/4 meaning in each bar there will be three beats and they will consist of quarter notes.
3. The mood of the piece is '*sempre dolce*'. 'Sempre' means always and 'dolce' means sweetly. Thus, the whole piece should be played sweetly.

4. This is two eight notes. Together they are played for the same duration as one quarter note.
5. This is bar number 6. The bar number indicates the number of bars up to the start of a new staff.
6. This is a dotted half note. It is the same length as three quarter notes and is thus played for the whole bar, i.e. three beats as the time signature is 3/4.
7. A bar line.
8. At bar 9 the first bar line consists of two think lines and four dots on each side. This indicates that the music up to the lines should be repeated. From the thick bar line to the second bar line with the contents in-between, is called a measure or a bar.
9. This is a whole rest indicating that there should be silence for the duration of the measure.
10. The first circled note in the measure is lower than the second circled note. This means that the first note will be at a lower pitch and the second note at a higher pitch.
11. This bottom staff consists of five staff lines.
12. This ***fz*** is a dynamic indication. It means that the notes above and below the indication should be strongly accented. If the ***f*** was alone, it would have indicated that the performer should play loudly.
13. These are two quarter notes. As they have only one stem and are stacked on one another, they are played together and count for only one beat not two.
14. This is a quarter rest. The quarter rest counts as one beat and the half note, before the rest, as two beats. Together the quarter rest and the half note represent three beats which is the amount of beats indicated in the time signature.

2.3.6 Proposed ideal musical competencies for character animators

In summary, character animators who want to animate to music should preferably have the following musical competencies, i.e. it is suggested that they should be able to:

- Listen to a musical piece and recognise the melody (memorable series of pitches or the tune of a song);
- Listen to a musical piece paying attention to the harmony (the accompanying notes that support the melody usually as a countermelody or chords) and notice the changes from major to minor to understand the framework or context of the melody (like a setting in a story);
- Listen to a musical piece and notice and appreciate its timbre, i.e. tone colour or tone quality to identify instruments by ear;
- Understand that music has a flow and pace which is determined by a beat;

- Identify the tempo (speed of the beats per minute) of a melody;
- Calculate the rhythm (how many frames per beat) of a melody using a formula;
- Know and understand basic music terminology relating to tempo (words and metronome marks describing the speed of the beat on a piece of music);
- Know and understand basic music terminology relating to dynamics (abbreviations and their meanings describing the loudness of the music);
- Know and understand basic music terminology relating to mood (terms describing the feeling the music wants to portray);
- Know and understand basic music notation of pitch indicated by the placement of the note on a staff (five parallel horizontal lines);
- Know and understand basic music notation of pitch indicated by a clef (a symbol indicating which pitch to use for which staff line);
- Know and understand basic music notation such as pitch duration (length of a beat or note indicated by different notes);
- Know and understand basic music notation such as duration of silence (how long silences should last indicated by different rest values);
- Know and understand basic music notation relating to duration such as rhythm (all the duration indicators used in conjunction); and
- Know and understand basic music notation relating to duration such as time signatures (the set number of beats between two bar lines expressed as a fraction).

2.4 Conclusion

With reference to McLaren's view that animation is about what happens between the frames, this chapter suggests that to integrate music and animation, character animators require a basic musical knowledge and skill set to push the boundaries of what is possible in movement. It is this competency set that will strengthen the integration of music and animation to create the intended meaning.

In the next chapter, musical scenes in the South African animation feature film *Khumba* (2013), made by Triggerfish Animation Studios, will be examined from the perspectives of both music and animation. More specifically, the focus will be on how the character animators integrated the music (pre-recorded) and animation in a musical scene to produce the performance of the character.

Chapter 3:

Animating Performances to Music: The Case of *Khumba*

3.1 Introduction

"Cartoons [character animation features] are performances in the same sense as other kinds of artistic performances – symphonies or orchestras or poetry readings" (Crafton xiv). In comparing it to conventional film-making, Crafton says that animation is a similar kind of performance art but with its own set of artistic conventions, technologies, and audience expectations (University of Notre Dame). Crafton argues that animation characters have the same status on the screen as human actors and that it is the animation feature, not only the individual characters, which creates a world and an experience (University of Notre Dame). Even though Crafton refers to 2D cartoon characters, it could apply to 3D animation characters as well.

Crafton takes a historical look at early studio animation in the United States to discover how these films are viewed and received, specifically how successful they are in terms of performance (Dobson). To explain the ways in which performance is displayed and viewed, Crafton distinguishes between performance *of* animation and performance *in* animation. He argues that all performance can be broken down into one of these categories, and suggests that performance in animation concerns the characters and movements within the film, while performance of animation concerns the filmmakers and audiences (Crafton 17-18).

In an animated feature, the character is not treated in the same way as a live-action actor or dancer; they are not performing by reading lines or using their own talent to act in a certain way, rather they are created, directed and manipulated by animators (Dobson).[25] Dobson proceeds to introduce the notion of the animator becoming an actor through the creation of the character as introduced by Wells ("Understanding Animation" 107). It is the animators who use their knowledge (of acting) to 'perform a part'. Even though the audience is aware of this artifice, they accept the 'success' of the performance (and narrative) and understand the character. This idea is supported by Ivins-Hulley who further suggests that while the audience know that the characters are not alive (he refers to stop-motion puppets), the "performance carries a paradoxical indexicality: the puppet tangibly exists

[25] This excludes motion capture which is a performance driven production method which relies on stage performers to act out the motions which is then digitally captured (Furniss, "Art in Motion" 189).

outside the film, but its movement does not" (Dobson). Here, the puppets' performance is 'in' animation because although the audience is aware of the animator they are looking at the movement within the film. They read the indexical signs, which relate to their own and can understand the meaning. When the animator's work (or indeed the role of the audience) is considered, the performance is 'of' animation (Dobson). The distinction between performance 'in' and 'of' animation is crucial for understanding the analyses of the case study *Khumba* which is presented in this chapter.

This chapter commences with a discussion of the story and background to the film. An analysis of the performances 'of' animation, i.e. how *Khumba* was made (including the processes followed to animate the musical scenes), is presented, informed by interviews conducted with members of the filmmaking team, specifically the director and animators involved in the film. Thereafter, the analysis focuses on the performances 'in' animation. One of the musical scenes in *Khumba*, i.e. Bradley's "Swan Lake" scene (which will be used for illustration purposes later), is analysed. This analysis is informed by insights gained from watching the film and from interviews conducted with the animators. The physical movements of the character are assessed, while at the same time the movement of the music as part of the performance is considered. The analyses are conducted from an animation perspective and not from a musical perspective.

3.2 Artistic expression through animation: background and synopsis to *Khumba*

Triggerfish Animation Studios is the studio responsible for the creation of the animated feature film *Khumba* which follows on the success of their first film *Adventures in Zambezia* (2012). These two animated films have put South Africa's animation industry on the world map; both films have won numerous international awards and have been distributed in all the major film markets (Meintjes). According to Stuart Forrest, Triggerfish Chief Executive Officer (CEO):

> We have released [the two films] in 150 countries worldwide. They have been translated into 27 languages. By African standards, that is really huge, they are massive movies compared to most movies being made on this continent. We now have an opportunity to tell our stories to the world in a medium that has come of age for independents. A few decades ago there were only a few studios in the world that could make animated films, now the tools are in our hands. (Meintjes)

The Academy Award-winning British producer, Michael Rose, who has recently completed the animation short film *Stick Man* for the BBC (also produced by Triggerfish Studios), has lauded the South African animation industry's high production values and quality of work:

> The animation industry in South Africa is a young industry, but growing rapidly. There is a lot of exciting young talent here starting to emerge, with careful nutrition and development, that is going from strength-to-strength. The South African industry has a fantastic future and we are exciting to be working with it. (Meintjes)

In 2016 Triggerfish announced that they were in the process of establishing a multi-million rand Story Laboratory in collaboration with Disney to help produce animation films with an African flavour (Meintjes). According to Forrest, there is a hunger for stories from the African continent and for animation films with an African flavour (Meintjes). Silverston adds that even though Triggerfish will not limit themselves exclusively to telling stories set in Africa, the stories will be African in that the artists creating them are from Africa as "the people and environment around us are a big source of inspiration and we have an opportunity to bring a unique perspective to the world" (Hart).

Khumba was released in South Africa on 25 October 2013 where it held the number one spot for two weeks. It was later released in the UK and elsewhere.

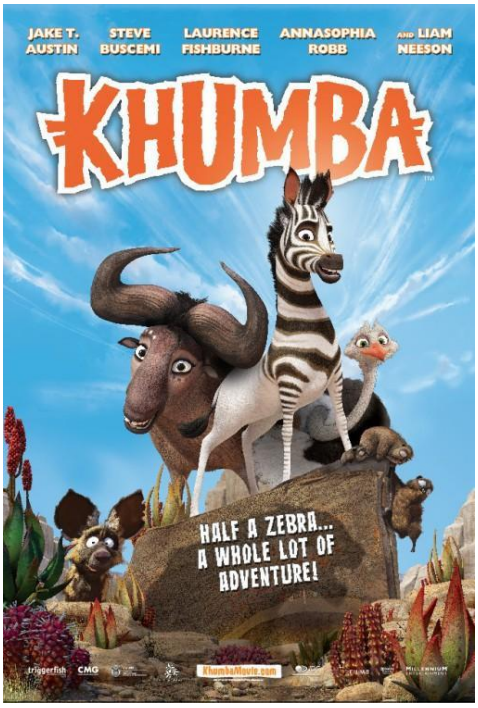


Figure 21: Poster of the animation feature film *Khumba* (2013). Digital image. *Khumba*. Directed by Anthony Silverston, Triggerfish Animation Studios, 2013. DVD.

Khumba received acclaim as the New York Times 'Critics Pick' and in 2014 won two International Gold Panda Awards for the Best Overseas Animated Feature and the Grand Prize for animation from a total of 682 entries from 42 nations and regions. Furthermore, preparations are underway for the Broadway production of *Khumba* (Hart).

3.2.1 The synopsis of *Khumba*

Khumba, according to Triggerfish's description and production notes, tells the story of a half-striped zebra born into an insular, superstitious herd. He is immediately ostracised by the rest of the zebras except for his mom and dad, and Tombi, a feisty tomboy. The herd turn their back on the young Khumba, blaming his difference in appearance for the onset of a severe drought. A chance meeting with a mystical mantis leads Khumba to leave the only home he has ever known in pursuit of a legendary magic waterhole where it is believed the first zebras bathed and came out striped.

Alone in the wilderness, Khumba has a narrow escape from an opportunistic wild dog and joins forces with an overprotective, sassy wildebeest, Mama V, and Bradley, an insecure but flamboyant ostrich. The unlikely trio meet an array of wacky characters on the way including a migrating herd of springbok, a looney, old sheep, Nora, living on an abandoned farm, a fanatical doomsday cult of dassies (rock-rabbits), and an endangered riverine rabbit whose *kamikaze* survival strategy has clearly gone to his head.

As Khumba and his two side-kicks make their way across the vast landscape, they are tracked by Phango, a sadistic leopard who believes that he derives his power from eating young prey and that Khumba, the unique, half-striped zebra is the most powerful of them all. The story ends when, in a hair-raisingly epic battle, Khumba succeeds in defeating Phango and ultimately earns his stripes.

3.2.2 The inspiration behind *Khumba* and lessons to be learned

The film touches on themes inspired by Silverston's experience of growing up in South Africa, but ultimately it is a story about learning to be comfortable in one's own skin (Hart). According to Anthony Silverston, *Khumba*'s director and writer, the idea of the story came to him in 2003, and long before his involvement with Triggerfish (Hart). The story was inspired by the quagga, an extinct sub species of zebra that lived in South Africa until the 19th century which had brown stripes on half of its body

and head. The story, Silverston explains, is drawn from his own ongoing quest to feel "whole"; to feel comfortable in his own skin (Smit). "It's a story about difference, whether it's skin colour or sexual orientation, or anything, and about overcoming that feeling of being inferior because you're different. The black-and-white stripes is such a great metaphor for that because it's a visual metaphor" (Silverston in Mallory).

Khumba is a coming-of-age story about a zebra searching for his missing stripes to be accepted by his herd, but his journey is about accepting himself (Triggerfish). The question, "How many stripes does it take to make a whole zebra?" implied by the gemsbok healer, is at the heart of Khumba's quest. In continuously focusing on his difference, at what point will he really be okay with himself? The name "Khumba", which comes from the isiZulu and isiXhosa word for "skin", is quite fitting as Khumba has defined himself by his exterior, for example by his skin markings. He wants to get all his stripes, he wants to change, but instead, he needs to embrace his difference. It is only when he recognises his difference as a good thing that he looks beyond himself and finds the courage to help the rest of the animals in the Karoo.

While the actual plot for the film evolved as Silverston and his co-writer Raffaella Delle Donne developed the story into a screenplay, the core of the story remained the same over the years (Smit). Silverston and Delle Donne went on to enter the script for a competition run by the UK Film Council and NFVF which they eventually won in 2006 (Smit). This achievement set them on the path to make the film a reality – a film that encourages children to not just tolerate, but rather celebrate difference: whether it is in relation to race, religion, culture, class or sexual orientation (Triggerfish).

3.3 Performances 'of' animation: the making of *Khumba*

In pitching the project for the scriptwriting competition, the Triggerfish team said that the story had the quirky humour of *Chicken Run* and the spirit of *The Lion King* (Hart). They worked with Richelle Wilder who was the head of development at Aardman during *Chicken Run* and with Jonathan Roberts, one of the co-writers of *The Lion King* (Hart).

A star-studded cast was behind the voices of the characters, including Liam Neeson (Phango), Jake T. Austin (Khumba), AnnSophia Robb (Tombi) and Richard E. Grant (Bradley). There were about 37 speaking roles and Triggerfish wanted to use South African, American and British voices. Local comedian, Rob van Vuuren, did a number of read-throughs and demo recordings voicing every role in

the movie, helping to inform many of the characters. He was also cast as the springbok captain. Casting was therefore a major process conducted by Ned Lott, the casting director. Recording these voices, Silverston said, "was an intense but exciting process with many memorable moments" (Hart).

Music and sound, according to Silverston, play a key part in creating the unique atmosphere of the Karoo (Triggerfish). For the audience to tangibly experience the quality of the Karoo, Silverston says, a soundtrack was used that brings out the sounds of the landscape such as the creaking windmill and the buzz of cicadas (ibid). To bring out the theme of 'difference' and the variety within the Karoo, different musical themes and instruments were used (ibid). Khumba also meets various characters on his journey and to reflect these, each character and/or scene was given a different dominant instrument. The challenge for the composer, Bruce Retief, was to put everything together into a cohesive musical soundtrack (Triggerfish). Silverston describes the soundtrack as follows:

> Act 1 is mostly inside the zebra fence so we looked to a more traditional sound – what is recognised internationally as "African". The Mantis is our link to the KhoiSan – the indigenous peoples of southern Africa – and so his sound is created from vocal "clicks", while Act 2 is mainly outside the zebra enclosure – Khumba's quest. It has a more local "Karoo" sound and it tied together with the "Ghoema" rhythm. Act 3 is where everything comes together – the zebras join the rest of the Karoo animals in a dramatic (more orchestral) battle against Phango. (Triggerfish)

Whether Retief succeeded in creating a cohesive musical soundtrack is open for discussion and is best analysed by someone with a film music background.[26]

With this background to the making of *Khumba*, specifically on how they approached the soundtrack, the production pipeline will now be discussed. This is followed by an investigation of the process of animating *Khumba*'s musical scenes.

3.3.1 *Khumba*'s production pipeline

Commenting on the production of the film, Silverston said that because they used nearly the same technical team who worked on *Adventures in Zambezia*, they could build on what they had learned

[26] The researcher only has an intermediate knowledge of music and does not possess the knowledge which is required to perform an in-depth analysis of *Khumba*'s soundtrack.

from the previous production. The results, he believes, are visible on screen, from the animation performances to the richly-detailed environments (Hart).

Quentin Vogel was the animation director on *Khumba* and was involved from the beginning with the production research and the development of the characters together with the director. He led and animation-directed a team of 25 animators and was involved in acting out video reference and choreographing scenes with the animators and director (ibid). Each one of the animators was part of a team allocated to one of the three lead animators, Daniel Snaddon, Matthew Lowry and Jaco Tromp. The different groups of animators were allocated different scenes to animate mostly randomly (Snaddon).

Triggerfish followed the standard production pipeline as described by Beauchamp in Chapter 1: the three stages of preproduction, production and post-production. The pre-production phase lasted a few years in which various tests were performed to finalise the characters and to determine the style of animation, such as character testing, rig testing, and motion tests (Lowry). A stylised look, for example, had to be found for the fur, as well as a system for creating a variety of highly-detailed plants which could work on both a macro and micro scale (Smit). It was also during this phase that a decision was taken to abandon the initial idea for *Khumba* to be created as a stop motion film (Snaddon).

It was important for Triggerfish to have a good 'blueprint' for the film resulting in a substantial amount of information on the storyboards which laid a solid foundation to start with (Snaddon). From the storyboard, the animatic was developed with information such as the posing, the timing, the layout and camera positions (Snaddon; Courchay). Only after the animatic was completed could the animators start with the job of animating.

For regular performance scenes, animators received the animatic, a director's video notes which highlighted what he envisioned for the scene. For the dance scenes, a scratch track was incorporated in the animatic. Animators also received the dialogue, the previs[27] video and layout of the scene (Lowry).

After all the separate scenes had been edited and composited during post-production, the scratch track was replaced by a fully recorded orchestral version of the soundtrack. This is in contrast to the

[27] A previs (abbreviation for previsualisation) is a representation of how a scene in a film would look when it is finished and consist of camera movements, and the placement and framing of characters, etc. (Lombard).

production process Beauchamp recommends (see Chapter 1). Beauchamp believes for a better result, the animators should have received the final soundtrack before the start of the animating process.

3.3.2 The process of animating *Khumba*'s musical scenes: how the actions of the characters were manipulated

Khumba is not a musical, but it does have musical scenes. Some of these scenes are short and consist of chants accompanied by small rhythmic movements or dances, while some are longer scenes with more instrumentation and dances.

Snaddon admits that there is very little experience about animating musical scenes in South Africa. According to most animators interviewed as part of this research, it is more difficult to animate dancing humans, than dancing animals. The reason might be that the audience are used to seeing humans dancing and would therefore be able to more easily spot mistakes, while they are not accustomed to seeing animals dance.

It is a common understanding that there is no right or wrong way to animate a musical scene. As Nico Venter, a freelance animator, says, "I think it depends on how you were trained". Courchay and Lombard concur and say that every animator animates differently. Lombard adds that it is also workflow dependent, while Cutler believes that animating is a personal thing and that although methods may differ, it's about getting the required end results.

Even though every animator animates differently, there are certain agreed-upon steps that animators follow when animating a musical scene. Through the interviews it surfaced that the process of animating musical scenes with *Khumba* started with a brief by the director or animation lead. The director then explained his vision and what mood he wanted. He spoke about the characters involved, the style of the dance, the music, the timing, how long the shots needed to be, and what the sequence of events should be (Croudace). Lowry notes that the director "was quite open to input for the dancing scenes" resulting in the briefing sessions being a space where everybody could provide input. This creative freedom was welcomed by all animators because "the director and the animation director can only go so far to say what they want. Then it's the animator's job to keep in that vision, but make the shot your own" (Lowry).

The *Khumba* animators usually received music upfront. For example, “with Bradley, [Samantha] would have got a scratch version of the song to the correct timing which will include the melody produced by a synthesiser and accompanied by voices (if applicable), then she would have been briefed on what needs to happen … and started from there…” (Snaddon).

The next step in their process was to listen to the scratch track and analyse the beats or hits. Each animator devised their own method for animating to the scratch track. They would start by working out the tempo and frames per beat. Instead of marking each beat, some like Croudace, will combine the scratch track with an audio click track to find the beats. *Khumba* animators will then try to identify the mood and certain aspects of the music that stand out to portray it through the character’s movements. “You can hear in the music when it’s rising or when it’s going into some kind of crescendo…, and you want the dance to mirror that”, says Pienaar.

Courchay says that having a demo or scratch version of the music beforehand made things easier because knowing the tempo helped define the process. It also helps the animator to have a clearer picture of what the final scene would look like, instead of hoping that the composer will write music afterwards that will fit the overall feeling and movements of the character (Courchay).

The animators then had to decide on a style of dance and find real-world human dancer references. Some animators even danced out the scene themselves. Lowry confirms reference is essential and Snaddon adds that every dance has its own specific character and to make the character’s movements believable to the audience, requires a great deal of research. Reference for dance scenes is especially important if the animator has no dancing background or knowledge (Lombard).

Animator Samantha Cutler is a professionally trained dancer. So, instead of finding reference footage, she choreographed the dance herself, recorded it and then copied it “through the lens of the character”, explains Croudace. Cutler adds that she filmed herself dancing to the scratch track from various angles. Even though Cutler had the pre-recorded music for animating *Khumba*’s dance scenes, she says that “you just stick to the scratch track and hope that they don’t make the sound too different when it’s done”, emphasising the importance of final pre-recorded music and involving the animator in the post-production process (Cutler).

Next, the animators identified the key poses or major extremities of each motion. Some animators drew out these poses and others selected the main poses and blocked them out in the scene[28]. Once she has her reference footage, Cutler notes:

> I would normally go through it to choose the main poses and then I take screen grabs of them. I always write down what frame number the jpegs are on and then I copy those poses with my character and I try to … exaggerate [them] as much as I can. Because I've already got the frame numbers of each pose, it's easy to time... (Cutler)

Finally, animating the musical scenes commenced. There are many different methods of animating, says Lombard. The two most prominent methods are straight-ahead[29] and pose-to-pose[30] (Webster 24). According to Lowry, the straight-ahead method is difficult to use when animating a dance sequence. The pose-to-pose method provides more structure, but some animators find that they have more freedom with the straight-ahead method, he adds.

The animation was then passed between the lead animator, animation director and director in a back and forth manner until scenes were approved (Courchay).

It is clear from this account that *Khumba* animators developed and used their own methods for animating musical scenes. Furthermore, none of the animators used a bar sheet which confirms my belief that contemporary animators do not use a universally recognised method to animate musical scenes.

3.4 Performances 'in' animation: *Khumba*'s musical scene

In this section, the musical scenes in *Khumba* will be identified and an analysis of one of the scenes, i.e. Bradley's "Swan Lake" scene, will be presented. This scene was chosen as it is the most appropriate scene for illustrating the proposed notation in the next chapter.[31] The analysis was done by watching the musical scene in the film and noting the animation visually in combination with the audio.

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[28] This process is no different from animating any action and is not only applicable to dance – the standard pose-to-pose approach.
[29] Straight-ahead is the process of animating in a chronological order; one frame after the other (Webster 24).
[30] Pose-to-pose is the process when the animator creates the important poses first and subsequently creates the frames in-between these moments (Webster 25).
[31] Unlike the other scenes, the music notation for this scene was accessible to the researcher.

3.4.1 Musical scenes in *Khumba*

Khumba has six musical scenes which either contain some sort of dance or rhythmic movement or singing (refer to figure 22). Although some of these scenes are very short they can still be classified as musical scenes.

Scene 1: Tombi Wins the Race

(00:07:10-00:07:22)



Scene 2: Zebra Cheerleaders

(00:08:48-00:08:57)



Scene 3: "Ostracized" as performed by Bradley

(00:27:54-00:28:48)



Scene 4: Bradley's "Swan Lake" Ballet

(00:43:25-00:43:45)



Scene 5: The Rock Dassie Dance

(00:48:37-00:49:25)



Scene 6: Bradley Feels the Beat

(00:49:37-00:49:42)



Figure 22: The six musical scenes in *Khumba*. Screenshots by Author. *Khumba*. Directed by Anthony Silverston, Triggerfish Animation Studios, 2013. DVD.

All six these scenes can be viewed on the accompanying CD (refer to Video Clip 1). A detailed analysis of one of these scenes, i.e. Bradley's "Swan Lake" scene, is presented next.

3.4.2 Analysis of Bradley's "Swan Lake" scene

In Bradley's "Swan Lake" scene Bradley, Mama V and Khumba find a striking waterhole after crossing the fence and meet some endangered animal species. When the tourists come to look at them, Bradley wants to catch the spotlight and accidentally gets shot by a tranquiliser dart on his head. He immediately drifts away to a dream world in which he is the star (refer to figure 23).

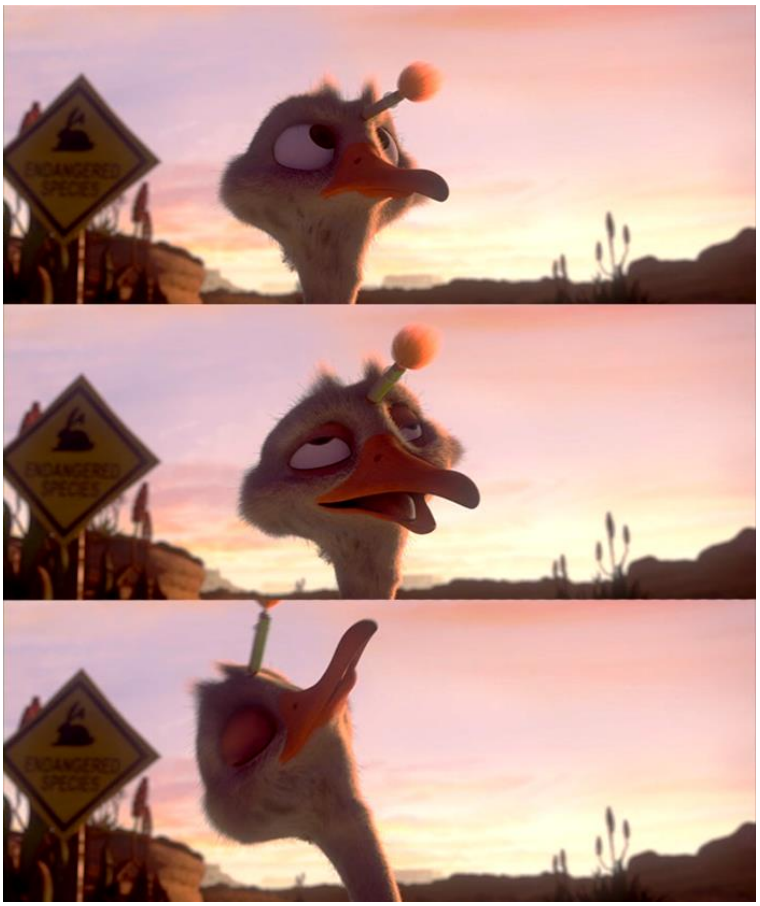


Figure 23: Bradley gets shot and enters a dreamlike state where he believes he is the star of the show. Screenshot by Author. *Khumba*. Directed by Anthony Silverston, Triggerfish Animation Studios, 2013. DVD.

Bradley's movements are synchronised to the music which becomes part of the performance. In this performance both the ostrich (and his skilled movement) and the animator who manipulated the movement to fit the music, is captured. The ostrich inhabits a distinct character through the movements. A flair for the dramatic, eccentricity and sensitivity can be sensed and is reflected in his performance.

Samantha Cutler, who was responsible for animating the "Swan Lake" scene, mentioned that the scene wasn't supposed to be in the film.[32] It was an idea that she and a colleague proposed which the director loved and decided to add to the film.

The scene changes to a cave like environment with sunlight creating a spot light effect on Bradley (refer to figure 24). He elegantly does ballet to Tchaikovsky's "Swan Lake" *Op.20 – Act II. Dance of the Swans*.



Figure 24: In the cave with the 'spotlight' – Bradley gracefully starts doing ballet to Tchaikovsky's "Swan Lake". Screenshot by Author. *Khumba*. Directed by Anthony Silverston, Triggerfish Animation Studios, 2013. DVD.

This whole scene contrasts to Bradley's usual wonky-clumsy personality and adds to the dreamlike feeling (refer to figure 25). Again, the environment is used as a stage.

[32] Please note that the interview with Cutler was done a few years after the film was made therefore it was difficult for her to remember all the details.



Figure 25: Bradley does a *demi-plié* from side to side. Screenshot by Author. *Khumba*. Directed by Anthony Silverston, Triggerfish Animation Studios, 2013. DVD.

Only the start of the "Swan Lake" melody is used with the oboe playing the melody and the string section playing the trembling harmony. The scene ends with Bradley holding an elegant pose while he imagines himself famous and cameras flashing all around him (refer to figure 26).



Figure 26: Bradley's finishing pose as the cameras flash. Screenshot by Author. *Khumba*. Directed by Anthony Silverston, Triggerfish Animation Studios, 2013. DVD.

Bradley's "Swan Lake" ballet scene is analysed using as a guideline Coyle and Peter Morris's method when they analysed the musical scenes in *Wallis and Gromit* (2005). Coyle and Peter Morris detect and describe musical concepts such as melody, timbre, notation, and harmony which complemented the actions that occurred at specific times on the screen (Coyle 191-208).

In this analysis the physical movements of the character in the scene are assessed, while at the same time the movement of the music is considered. Various inconsistencies are visible between the showreel segment and the final scene in the film, which may indicate that what the animator intended and how the scene was composited were not the same. This analysis compares Bradley's "Swan Lake" scene as intended by animator Samantha Cutler in her showreel with the same scene in the film.

To compare and analyse the scene, the timing on the compiled video clip is used (refer to Video Clip 2 on accompanying CD). The original unrendered scene taken from Culter's showreel is shown in the figures below on the left side and is referred to as Scene A, and the same scene in the film can be seen on the right side in the figures and referred to as Scene B.

For animating this scene, Cutler received a 15-second scratch track of the music. More specifically, it was the pre-existing recording from the conductor Riccardo Muti and the Philadelphia Orchestra recorded in 1984. It is a completely different recording to the final soundtrack in the film. The harp triplets were omitted in the final soundtrack, and it is in A-minor rather than the original B-minor

heard on the scratch track. The tempo of the soundtrack was around 78 BPM and felt much steadier than the scratch track which doesn't adhere to a strict pulse.

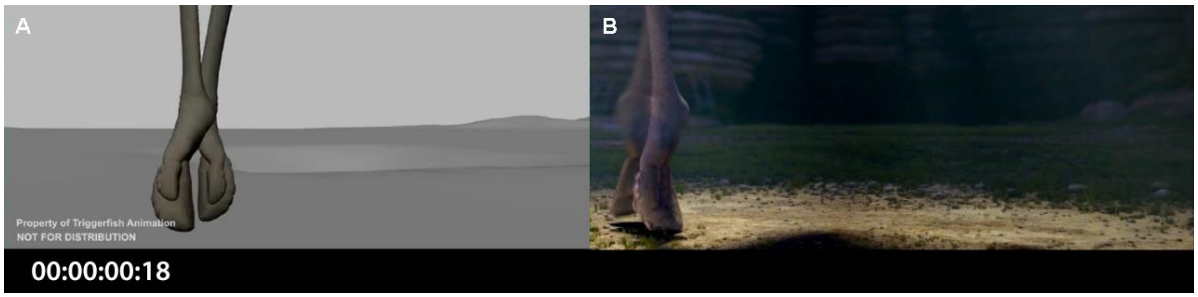


Figure 27: Bradley entering screen left in both Scene A (left in figure) and Scene B (right in figure). Screenshots compiled by Author.

The Bradley "Swan Lake" scene starts with Bradley entering from screen left on point in a *bourreé* to the violin tremolo (see figure 27).[33] The viewer initially only sees his feet and it is only when the oboe starts with the melody that Bradley's full figure is in frame. The timing of the scene is off in Scene B as Bradley enters later than what seems to have been intended. Both scenes fade at the same time to reveal Bradley's full figure in the centre of the frame flapping his wings. As soon as the oboe starts playing the melody at 00:00:03:10, Bradley flips his head up to the first beat as if to show that the performance is now starting. This happens simultaneously in Scene A and B (see figure 28). At this stage, Bradley's movements in both scenes – lifting his head and flapping his wings –are still synchronised to the beat of the music.

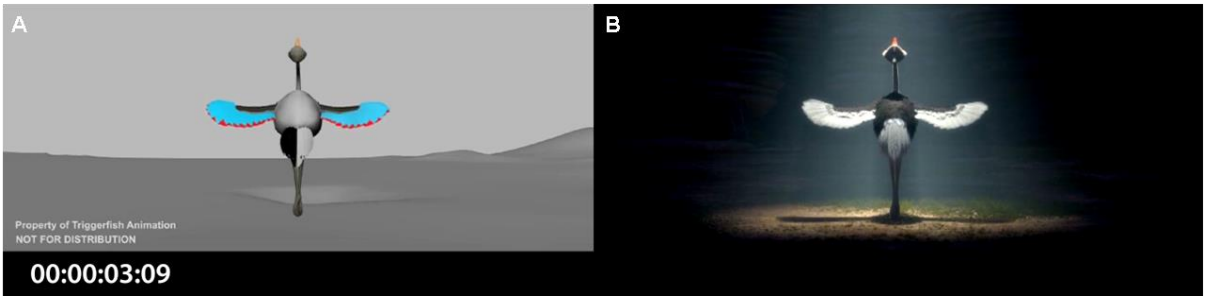


Figure 28: Bradley flips his head up in both Scene A and B. Screenshots compiled by Author.

Bradley then continues by doing a *demi-plié* to screen left to the strong beat of the music. He continues to do a *demi-plié* to screen right on the third beat, but this time he doesn't go down as low as with the first *demi-plié*.

[33] Please note that the researcher has a limited knowledge of ballet and ballet terms.

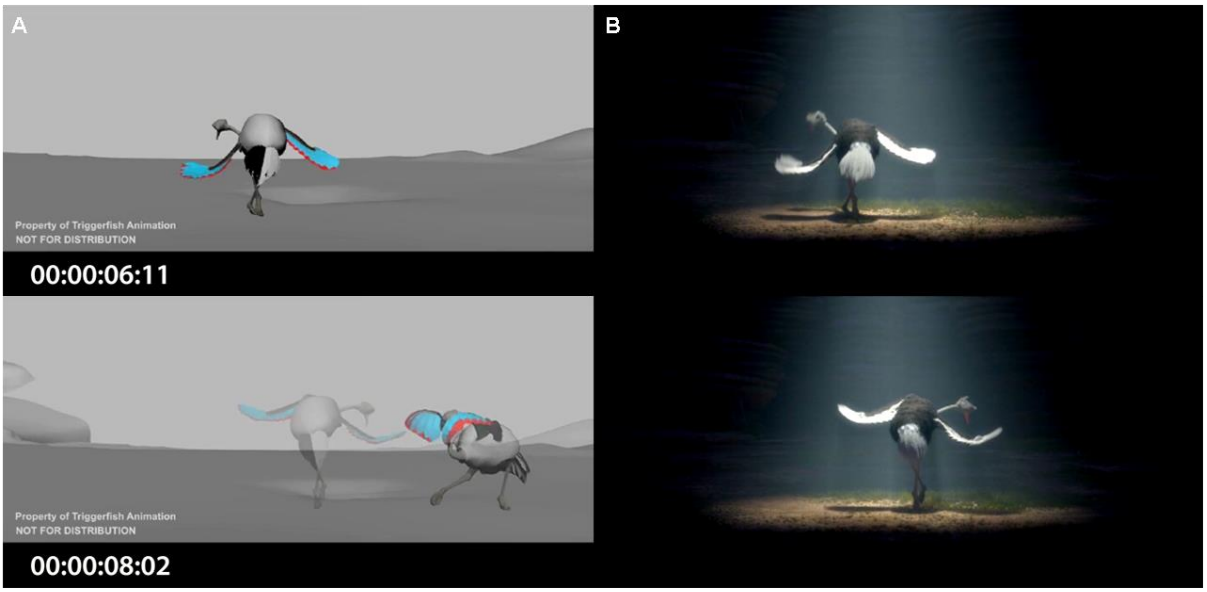


Figure 29: Bradley does a *demi-plié* to screen left then to screen right in both Scene A and B. Screenshots compiled by Author.

It is at 00:00:08:02 where Scene B (the scene as seen in the film) differs to Scene A (how Cutler intended the scene). Scene B, instead of fading to the next section where Bradley enters screen right as in Scene A, fades later and Bradley only enters when he is already supposed to be in an arabesque pose at 00:00:08:20 (see figure 30, Scene A). At 00:00:08:02 Bradley was supposed to prepare to go into the pose on the first beat, but it is clear from Scene B in figure 29 that he is still recovering from the *demi-plié.*

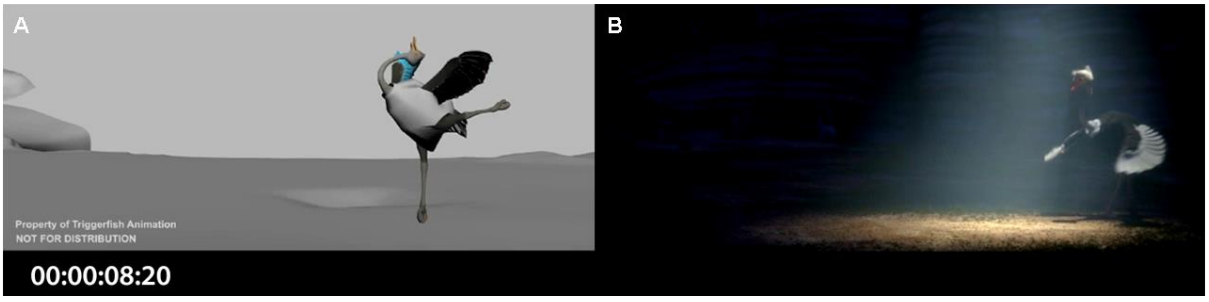


Figure 30: Bradley in arabesque pose in Scene A and Bradley entering screen right in Scene B. Screenshots compiled by Author.

The pose (see figure 30, Scene A) is held for the full note value. As the music changes to the next note, Bradley goes out of this pose putting his legs together in preparation of the *soutenu* turn (see figure 31, Scene A).

At 00:00:06:11, 00:00:08:02 and 00:00:09:20 sequential notes in the music repeat three times. It is clear from Scene A that the animator intended Bradley's movements to be in sync with each of these sequences. On the first sequence Bradley does a *demi-plié* to the left, on the next sequence he does a *demi-plié* to the right but at the same time goes into the arabesque pose. On the third sequence Bradley does his *soutenu* turn. Bradley's movements therefore build up as the music builds up.

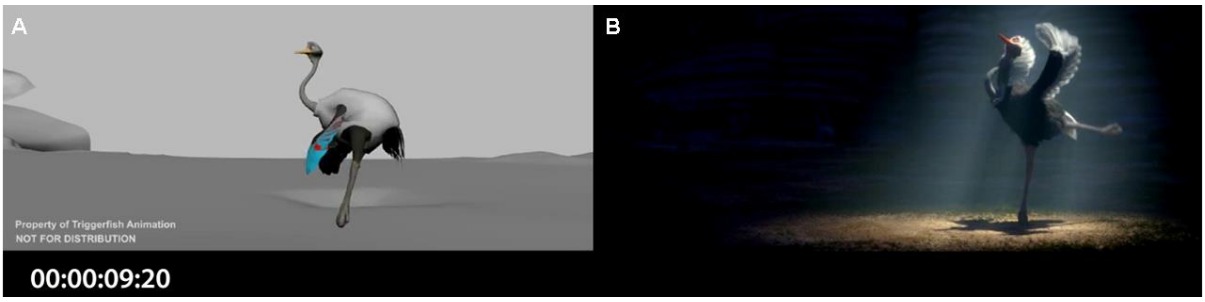


Figure 31: Bradley with toes together in Scene A, and Bradley only now in arabesque pose in Scene B. Screenshots compiled by Author.

The *soutenu* turn starts at 00:00:09:20 with Bradley on his toes (see Scene A in figure 31). At this time Bradley in Scene B is only at the arabesque pose. The whole Scene B is therefore out of sync.

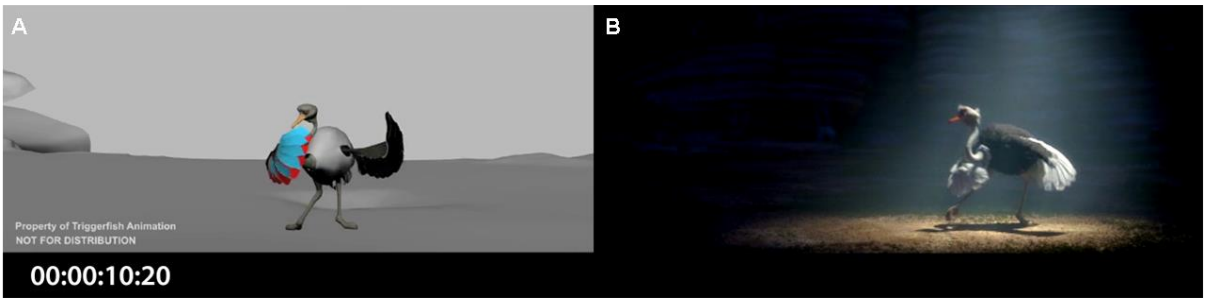


Figure 32: Bradley in a lower position in Scene A, and Bradley still on his way into the turn in Scene B. Screenshots compiled by Author.

At 00:00:10:20 (see figure 32) Bradley is preparing for the final move. Every time the oboe plays the shorter lower note, Bradley's movements go down and go up again when the higher notes are played.

The music slows down from 00:00:11:15 as it near the end of the scene. Bradley's movements in Scene A at 00:00:11:15 to 00:00:12:15 (see figure 33, Scene A) is perfectly in sync with the music. In this part of the music five quarter notes follow each other and build up towards the end note. Each pose fits exactly to the accompanying note. In Scene B, however, Bradley is still preparing for this move and only starts it at 00:00:12:15 and is out of sync with the music (see figure 33, Scene B).

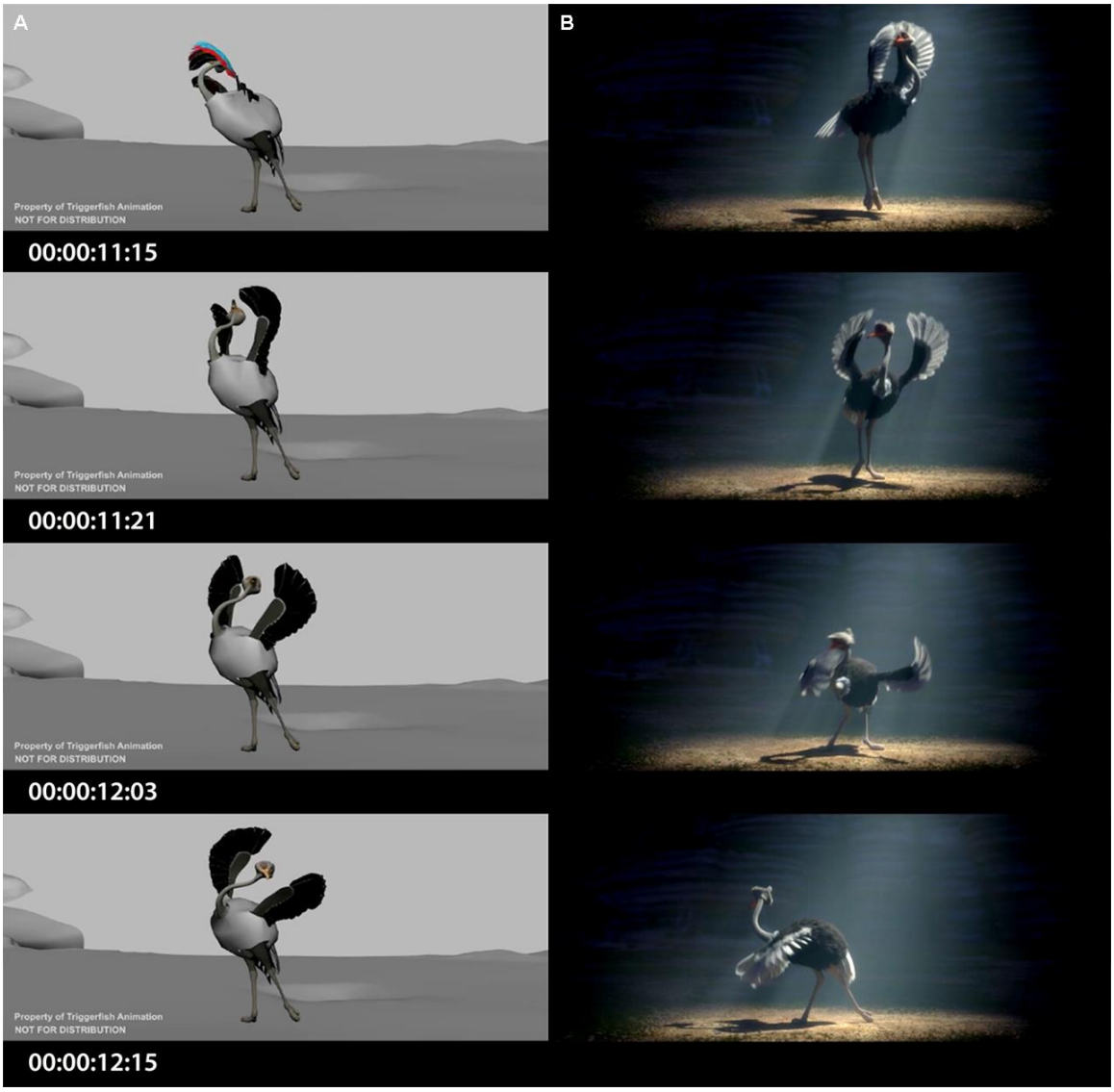


Figure 33: Bradley with arms in fifth position going into *encarte* end pose in Scene A, while Bradley is still busy with *soutenu* turn in Scene B. Screenshots compiled by Author.

Bradley's final *encarte* pose is reached in Scene A at 00:00:12:22 (see figure 34, Scene A) and ends perfectly with the last note of the music. Again, in Scene B, Bradley's movements are out of sync as it is a few beats behind his movements in Scene A. In the latter scene, Bradley is still on his way into the final pose while the music has already ended (see figure 34, Scene B).

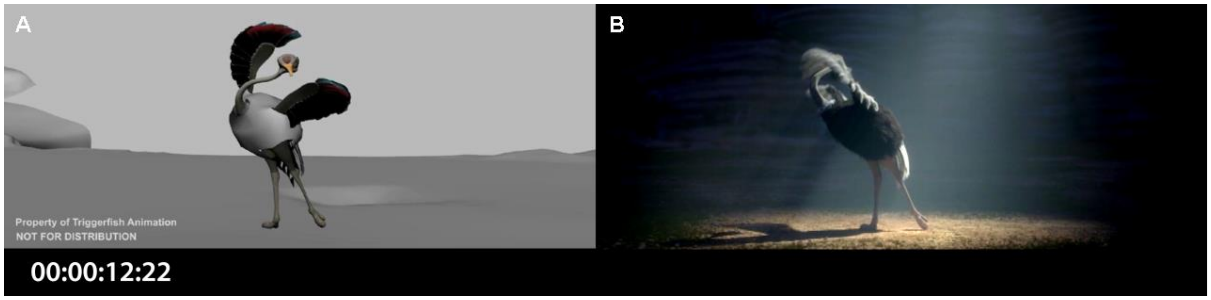


Figure 34: The final pose in Scene A, Scene B still going into the final pose.
Screenshots compiled by Author.

Bradley's ballet scene, according to lead animator Lowry, was:

> … one of the most fluent pieces of animation. And that, I think you can attest to the fact that Sam is a very good ballet dancer. She knew exactly what she was doing, regarding the moves themselves and she's a very good animator. And she's passionate about dance and music. So that really came through very well. (Lowry)

Fortunately for Triggerfish, Cutler has a ballet background and consequently also possesses some musical knowledge. If the scene had to be animated by someone else, the scene (as Cutler admitted herself) would not have been as true to the "Swan Lake" ballet, but merely an interpretation of what a ballet is.

One of the major challenges with this scene, was that Bradley's legs bent the wrong way (an ostrich legs bend differently to that of human legs). Cutler had to choose certain steps and poses that represent the "Swan Lake" ballet which consist of more straight leg movements. Another challenge, according to Cutler, was "forcing the rig to do what you want" which at some points resulted in breaking the rig.

As can be seen from the analysis above, the Bradley "Swan Lake" scene during post-production was incorrectly assembled which resulted in half of the scene being off-beat. Not only did the editor not follow the animator's intentions, but a completely different recording of the music was used, far more simplified than the original music animated to. Furthermore, a different tempo was used in the final mix – this clearly caused major problems for synchronisation and shows the various teams involved in the production were not communicating well to achieve a good musical performance. This could have been avoided if there was a closer collaboration between the animator and the editor which could have resulted in a better result in line with Powell's cinematic ideal of a composed film.

Using classical music recorded without a click, as in this situation, made it additionally difficult for the animator. Even if she had access to the score, it would not have given her accurate tempo information. The same applies for if the director had kept the Muti recording in the final soundtrack as it does not adhere to a strict pulse – it wavers around 77, 78 BPM with each bar slightly different.

Although Cutler did not know about my proposed notation to animate Bradley's "Swan Lake" scene, the fact that Cutler possesses musical competencies enabling her to synchronise the performance in the scene to the pre-recorded music (as can be seen from her showreel version of the scene), supports the first part of my argument. This is that character animators can in general benefit from having musical competencies. In addition, Cutler during the interview agreed that the proposed notation (the second part of my argument) would have helped her during planning in the pre-production phase. She also agreed that it would not have been possible to create such a successful performance if she did not have the pre-recorded music with the tempo, instrumentation, and the "Swan Lake" melody.

3.5 Conclusion

In this chapter, analyses of the performance 'in' and 'of' animation were presented by focusing on *Khumba*'s process of animating musical scenes and one of its musical scenes (i.e. Bradley's "Swan Lake" scene). The analyses were informed by interviews conducted with the director, some of the lead animators, and other animators who worked on the film.

The analysis of *Khumba*'s animation process found that *Khumba* animators developed and used their own methods for animating musical scenes. The analysis also revealed that none of these animators knew of or had ever used a bar sheet. This strengthens the suspicion that there is no universally agreed approach for notation to use when animating musical scenes. The use of such a notation would require greater collaboration between composer, animation director and leads, and choreographer during pre-production.

The central finding from analysing Bradley's "Swan Lake" scene was that having musical competencies helped the animator to animate the movements of the ostrich in this scene to fit the music, but that the final movements in the film are out of sync with the music. This indicates a lack of cooperation between the animator and the post-production team (Powell's broader ideal) resulting in *Khumba* not achieving Powell's cinematic ideal of a 'composed' film.

In the next chapter the interviews of the *Khumba* character animators on how they use musical knowledge and skills to perform the part will be analysed, and the musical competencies that would have benefited them will be explored in greater detail. A method will also be proposed and illustrated of how *Khumba*'s character animators could have used musical competencies to manipulate performances to fit the pre-recorded music in *Khumba*'s "Swan Lake" scene.

Chapter 4:

Proposition for How *Khumba*'s Character Animators Could Have Benefited from Musical Competencies

4.1 Introduction

Making characters 'come alive' to the beat of music is central to successfully animating musical scenes (Furniss, "Art in Motion" 80). As discussed, this 'coming alive' should not be confused with making the movements of a character seem realistic. The animator rather wants to achieve plausibility or believability so that the audience willingly suspends their disbelief or concerns for the technical and remains interested in the story (Beauchamp, "Designing Sound 1st Ed" 21). This is, as Subotnick explains, part of the attraction of animated film because of an awareness of the illusion that has been created (3). To bring a character to life within a musical scene, the animator shouldn't merely put his character through motions, but finds himself "being there", i.e. living inside the character (Thomas and Johnston 146). This corresponds with Wells's notion of the animator becoming a performer (an actor) through the creation of the character and who uses their own knowledge of performance to perform the part ("Understanding Animation" 107). In a similar fashion it can be said that animators, to use Small's term, are in effect 'musicking' when animating a musical performance (9). When 'musicking', specifically to pre-recorded music, character animators create visual actions according to a pattern set by the music with the timing of the movements coinciding with the timing of the music and so that the movement and the music both begin and end at the same point and reach their climax together.

Animating performances to music is a complex art (Musburger and Kindem 161) that can only deliver the desired results if the animator takes responsibility for the vision and controls the whole medium – how sound is integrated with the image (Halas and Manvell 81). This, of course, takes place within the bigger process of making an animated feature and ideally according to Powell's cinematic ideal (the composed film). In seeking a more coherent approach for musical scenes, Powell's broader ideal can also apply (Moor, "Gothic Riots" 1). Towards this ideal an approach for notation in animating to music that will facilitate the integration of all key aspects is needed. However, this is dependent on a universally agreed notation that uses musical information as cues to animate motion, which, as highlighted before, seems not to exist. As suggested earlier, the absence of such a notation can perhaps be due to animators understanding and knowing about animation, but not enough of music.

Evidence shows that the earlier animators did indeed benefit from having a basic knowledge of music, especially rhythm and tempo. Even though not all animators will necessarily animate musical scenes, it may be surprising that, except for three, most of animators interviewed for this study have experience of animating musical scenes. In this chapter, an approach for notation which requires musical competencies will be proposed for synchronising performances to pre-recorded music.

The notation proposed will be illustrated using one of *Khumba*'s musical scenes, i.e. Bradley's "Swan Lake" Ballet scene. This scene was chosen because it is the only musical scene in the film in which the final pre-recorded track and sheet music was available for *Khumba*'s character animators to use. The illustration aims to show how *Khumba*'s character animators could have used the proposed notation to synchronise performances to pre-recorded music. It is however only possible for them to use this notation if they have the musical competencies proposed in Chapter 2.

Taking a step back it is first necessary to know how *Khumba* character animators are currently becoming performers through the creation of a character, and to establish what musical knowledge and skills they have and how they use it to perform the part.

4.2 Becoming the character: musical knowledge and skills of *Khumba*'s animators and how they use it to perform the part

Being involved with an eclectic art, animators, as mentioned before, contribute different skills and experiences which all expands the technical possibilities of animation (Subotnick 5). All the *Khumba* animators interviewed possess some form of skill other than animating whether it is acting, dancing, or practicing martial arts such as jujitsu. Activities in which bodily movement and an understanding of weight and gravity is involved, as well as activities involving music, seem particularly popular with animators.

Most of the *Khumba* animators have a musical background or play a musical instrument but their knowledge of musical theory is limited. Courchay, for example, plays drums and used to play saxophone, but does not remember much musical theory. Lowry was in a band where he played guitar and sang but confesses that he cannot read sheet music. Snaddon plays guitar and a bit of piano, and like Lowry, says that despite taking piano lessons for a long time, he cannot read sheet music properly. Cutler obtained her musical knowledge mostly through dancing. She has been dancing since a young age and went to the National School of Arts where she had Dance History and Music as subjects. The

Khumba animators' comments above, correspond with the finding in Chapter 2 that many contemporary animators also have a musical background and an interest in music.

Although all of the animators expressed a love for music, they do not all believe that they have an innate musical talent. Croudace says that he loves music, and even though his musical knowledge is limited, he can play a song by ear. "I like music obviously, who doesn't? … but in terms of specific musical talent? No ... I don't think it's there", says Courchay. I find it strange that the animators believe that they do not have innate musical talents because most of them are self-taught musicians, such as Lowry, who mostly learned his skills through the Internet.

Most animators initially said that they do not understand basic musical concepts and how these concepts relate to animation, however, after being given some examples of musical terms in animation such as timing, tempo, phrasing, rhythm and beats, all the animators could recognise that they do know the musical concepts that are similar in animation. Lombard agrees that animators use musical terms in animation and adds that the concept of 'phrasing' is one of the important concepts to know when animating a musical scene. The notion that musical concepts are similar to concepts in animation, is also emphasised by Baena when he noted that musical terms have animation equivalents (refer to Chapter 2).

Interestingly enough, despite being sceptical initially, most *Khumba* animators after explaining how they use their musical knowledge and/or skills when animating a character, agreed that they do subconsciously use these skills when animating. Courchay says that he uses his musical knowledge subconsciously and explains that his drumming experience may be helping him with timing in a scene. Cutler agrees that her knowledge of dance is of great help to her when animating a musical scene even if it's more subconsciously. "I know how to keep a beat … essentially tempo and rhythm influence your musical ability but your animation ability as well. So hopefully subconsciously, having a bit of rhythm myself has helped my animation", says Lowry.

The animators support the view that having musical competencies can benefit them when animating musical scenes. Croudace agrees and explains that animators need to know about rhythm and tempo. He also notes that being able to identify the melody might help as it can clarify the mood and the feeling which will allow animators to animate their interpretation thereof. Knowing about time signatures and beats would help with seeing the bigger picture and animating accordingly, says Lombard.

Triggerfish intuitively made the correct decision when they allocated the musical scenes in *Khumba*. All of the *Khumba* animators have some form of musical knowledge and skills that had helped them to animate the musical scenes. However, they all use their musical knowledge and skills differently to perform the part. Most *Khumba* animators do use musical concepts when animating musical scenes, even if they are doing it subconsciously. In the next section a notation system for animating to music will be proposed which draws on the practices of earlier animators and combines it with contemporary practices and the technology that currently exists.

4.3 "Don't reinvent the wheel, just attach it to a new wagon": proposed notation for animating a musical scene

From the predominantly American and Disney centric analysis presented in Chapter 1, it is known that cartoon studios notably Disney Studios were responsible for the introduction of sound into animation. In those early days, music was always composed after the cartoon was animated or the music was performed live while the cartoon was shown. Disney's *Steamboat Willie* was seen as a breakthrough in animation with its synchronised soundtrack. Composers at that time, however, felt that music was merely treated as an add-on and pushed for animation to be created to the music instead of the other way around. This posed a major challenge for animators and there was initially no fixed method for animating to music until Wilfred Jackson offered the use of the metronome as a simple solution for both animator and composer.

The metronome enabled the musician to identify the required beats and tempo and the animator could animate accordingly. This method forced a closer working relationship between the animation team and the composer and/or musicians and they often had to work together in one central place. They had to find a way to track changes to either the music or the animated actions and Jackson developed a single bar sheet for this purpose. The exposure sheet that they used before only included enough footage for three or four beats. The bar sheet, however, contained the whole song spread out on a horizontal sheet and contained all the information of the music and the actions with the essential purpose to be able to view everything together. The format of the bar sheet is similar to that of sheet music where each staff is separated into bars. A Disney animator during the Golden Age would receive a bar sheet, tape or record of the soundtrack, a copy of the final storyboards to see how the animator's scene fits into the whole sequence, and the layout showing the size of the characters, their suggested positions, and the extent of their movements during a special session called 'the handout' (Thomas and Johnston 81).

Figure 35 shows an example of a bar sheet used by Hanna-Barbera's MGM for the cartoon *Tee for Two* (1945) indicating both the full sheet music and actions, as well as the sound and camera changes. As can be seen in this example the bar sheet is quite complex and can come across as messy.
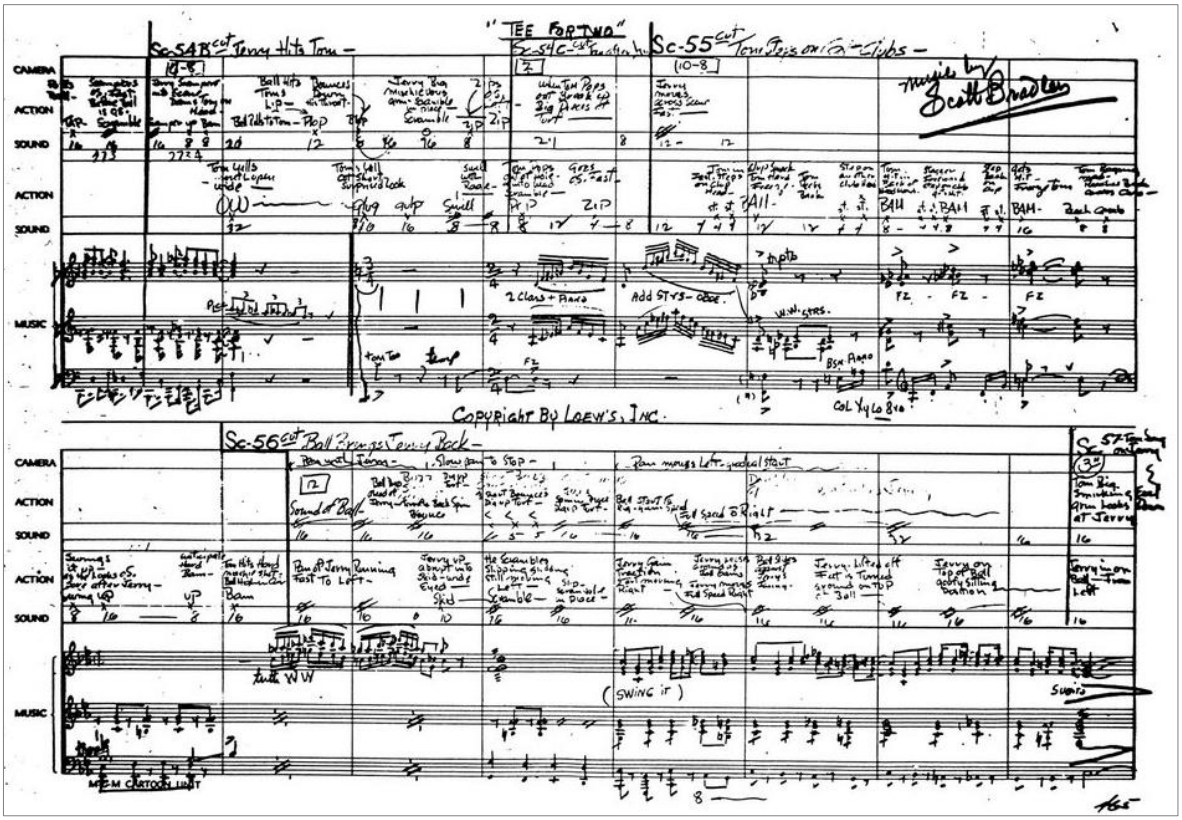


Figure 35: A bar sheet from Hanna-Barbera's MGM cartoon *Tee for Two* (1945). Digital Image. Cartoon, Comics and Model Sheets. "Timing Animation to Music." *Cartoons, Comics and Model Sheets*, 31 Aug. 2006. Accessed 10 Aug. 2016.

The next figure, figure 36, shows a more recent bar sheet developed by Amir Avni for *The Barley Way* (2009). In contrast to the previous bar sheet this one is simpler with fewer staves. It is also important to note that the music notation has fallen away although the music staff still remains on the bar sheet. Incorporated into this bar sheet is space for drawn or suggested key poses.

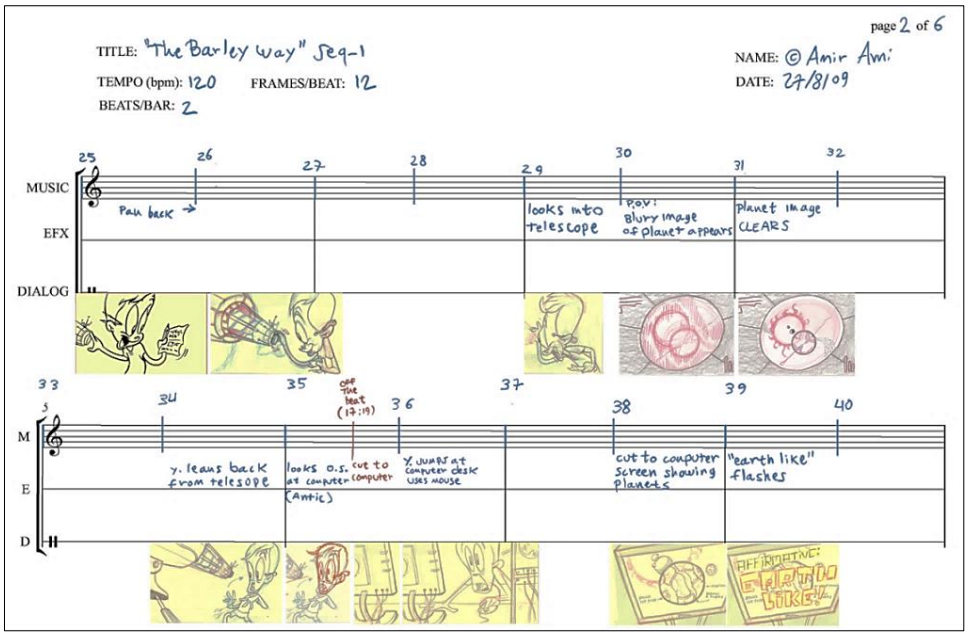


Figure 36: *The Barley Way* bar sheet used by Amir Avni in 2009. Digital Image. Avni, Amir. *Musical Timing 1: Influence on The Barley Way.* The Barley Way, 25 Sept. 2011. Accessed 10 Aug. 2016.

The current bar sheet templates available on the Internet look similar in format, but music notation has now been omitted completely. This may be due to the fact that contemporary composers compose in digital audio workstations and music notation would only be produced at the very end of the process if needed for real musicians to perform from. As will be explained later, this study argues that the notated score would be helpful for animators to use when animating a musical scene. The bar sheet in figure 37 is an example of a current bar sheet template.

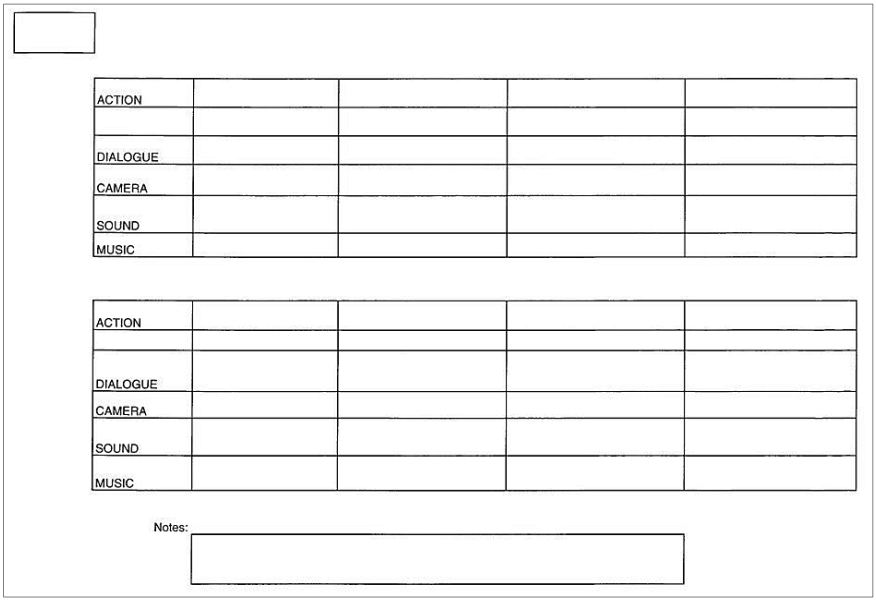


Figure 37: A present-day bar sheet template. Digital Image. Cartoon, Comics and Model Sheets. "Bar Sheet Template." Cartoons, Comics and Model Sheets, 26 Sept. 2006. Accessed 10 Aug. 2016.

The bar sheet without the musical notation that is currently in use, is not ideal for animators who want to animate to music as it is not possible to see the musical cues. In this instance, animators have to depend on the audio for analysing the piece of music by ear which can result in them missing important information they could have used for animating a more entertaining and believable scene such as the amount of beats a note represents and the mood terminology describing the feeling for the overall piece. This statement is supported by some of the animators interviewed such as Croudace who states that "I think where it will be effective might even be with people who are not that good at listening to music and who are more visual people." It is evident that the use of the bar sheet is not common practice as none of the animators interviewed have ever used a bar sheet when animating.

This research proposes that contemporary animators should not waste time and effort to re-create ways of doing things if these ways have proven to work well and that animators should adopt an approach for notation when animating musical scenes by using a newly devised bar sheet (described below), applying the proposed musical competency set (as presented in Chapter 2), and merging it with current practices and technology.

The new bar sheet proposed entails the reintroduction of an adapted version of the original bar sheet, combined with the latest bar sheet where images of the actions, or screenshots of key poses from the reference can be inserted (refer to figure 38). This bar sheet should include only one staff of musical notation displaying the melody or *leitmotif* (theme), time signature, tempo information and all other important information of the pre-recorded music. Even though contemporary scoring practice puts far less emphasis on written notation, the pre-recorded music focused on in this study requires not only an audio file but also sheet music. In the interview with Cutler she stresses that a musical notation would be helpful and says that it would help identify the music better.

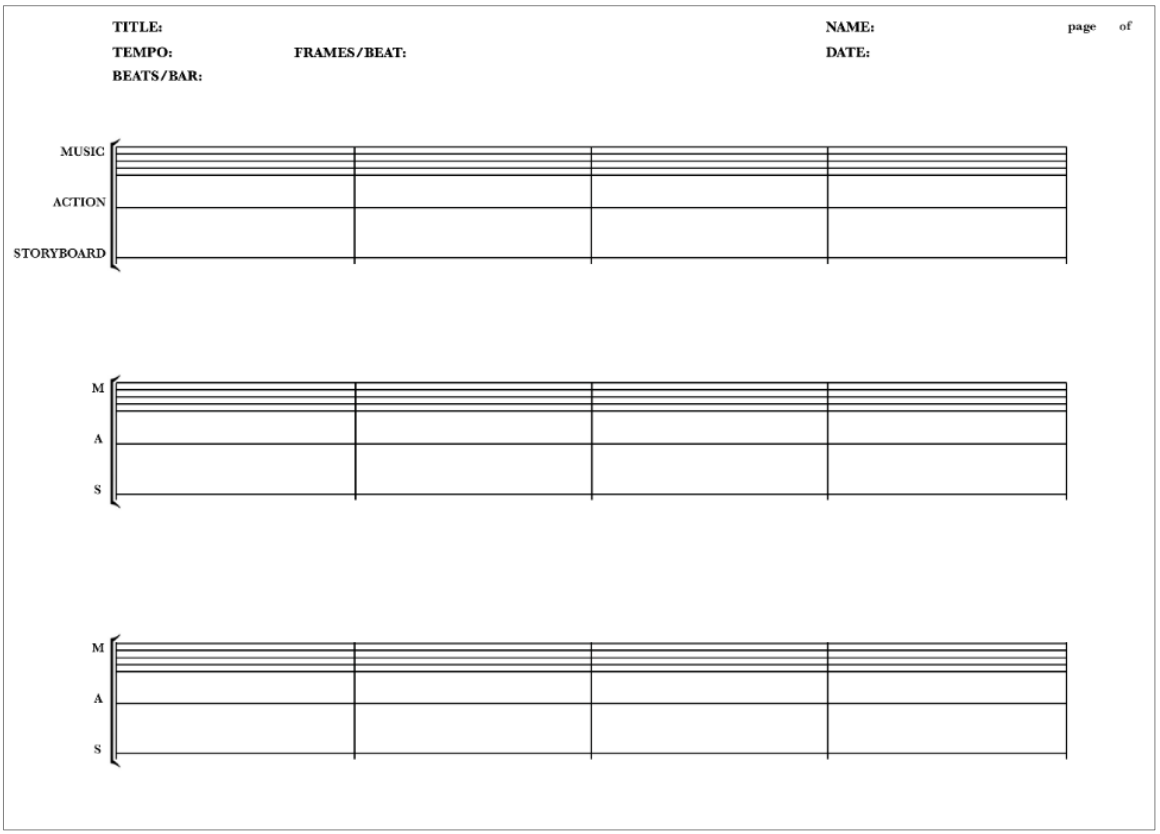


Figure 38: Blank proposed bar sheet for animating a musical scene. Image by Author.

It is proposed that animators animating a musical scene should during pre-production alongside the director's notes, the previs or animatic, rigged characters, and scene layout, also receive the proposed new bar sheet, an audio click track (replacing the metronome used by earlier animators), and the pre-recorded music audio (instead of a temp track).

Having the visuals and having it together with the music on one page would according to Pienaar be greatly beneficial to animators and notes that "often we've got too many little bits and pieces...". She adds that for her the use of an audio click track is the most beneficial part of the proposed method as it will, among other things, allow for better communication between the animator and the director.

An illustration of how this notation (i.e. the proposed new bar sheet) together with the proposed musical competencies can be used, and how it can be merged with current practices and technology, will be presented in the next section.

4.4 An illustration of how *Khumba*'s character animators could have used the proposed notation

The musical scene in *Khumba* where Bradley does ballet to the music of "Swan Lake" is used for illustrating the proposed approach for notation. As described earlier, Bradley, Mama V and Khumba in this scene find a waterhole where they meet some endangered animals. When the tourists come to look at them, Bradley accidentally gets shot in the head by a tranquiliser dart. He immediately drifts away to a dream world in which he is the star. Bradley in his dream state starts to do ballet to the music of "Swan Lake".

Tchaikovsky's *Dance of the Swans*, "Swan Lake" Opus 20, Act 1, number 9, Finale was commissioned in 1875 by Vladimir Begichev for the Moscow Imperial Theatre for a ballet and was inspired by a German fairy tale. It took him almost a year to finish "Swan Lake" as the music was quite complex. It was the first ballet Tchaikovsky ever composed, and only really became popular after his death (Frey).

"Swan Lake" was composed for a symphony orchestra and the orchestration consists of 12 pages (three of these pages can be seen in figure 39).
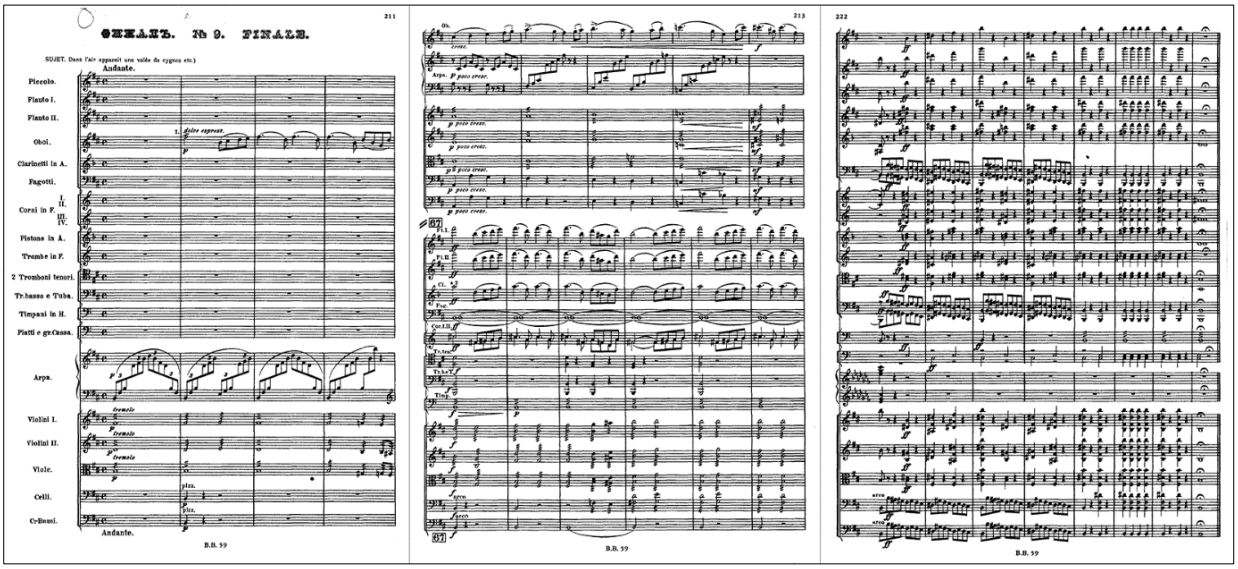


Figure 39: A few pages of orchestration of Tchaikovsky's Dance of the Swans, "Swan Lake" Op. 20, Act 1, no. 9, Finale (1875). Compiled by Author. Tchaikovsky, Peter Ilyich. *The Swan Lake Ballet*. New York: Broude Brothers, 1875. Web. 30 Dec. 2016.

Fortunately, the intention is not for the character animators to know how to read and interpret the whole piece. "Swan Lake", like all music, has a melodic theme that is prominent throughout the piece.

The animators only need to listen to recognise this melody or theme. In figure 40 the melody can be seen which is played by the oboe.
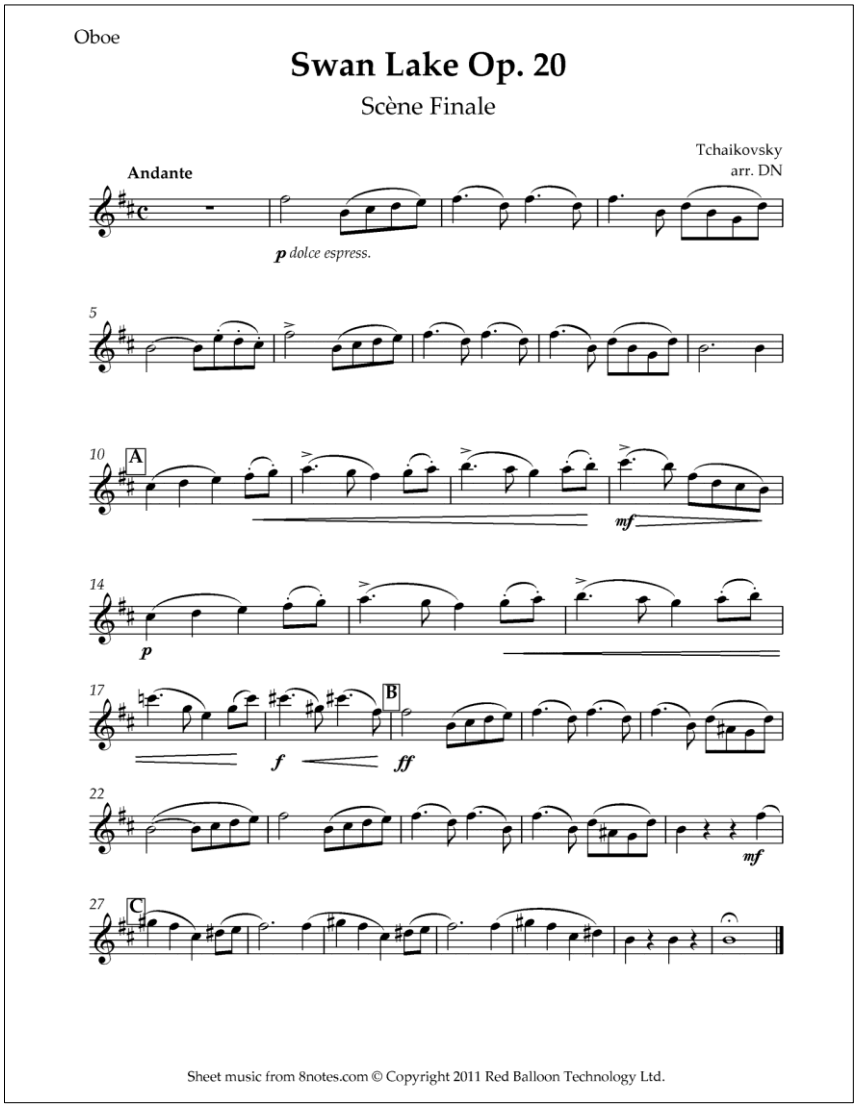


Figure 40: "Swan Lake's" melody as written for the oboe. 8Notes. "Tchaikovsky- Swan Lake Op.20 Scene Finale sheet music for Oboe." *8Notes*, N.d. Accessed: 16 Aug. 2016.

The melody is displayed on the newly proposed bar sheet which is handed to the animators. Figure 41 shows the empty bar sheet containing the "Swan Lake" melody used in Bradley's ballet scene which the animators would receive and which they would have to complete before commencing with animation. (*Please note that Bradley's "Swan Lake" scene only consists of five bars. For demonstration purposes, more of the score has been added to more clearly show the application of the proposed musical competencies*).

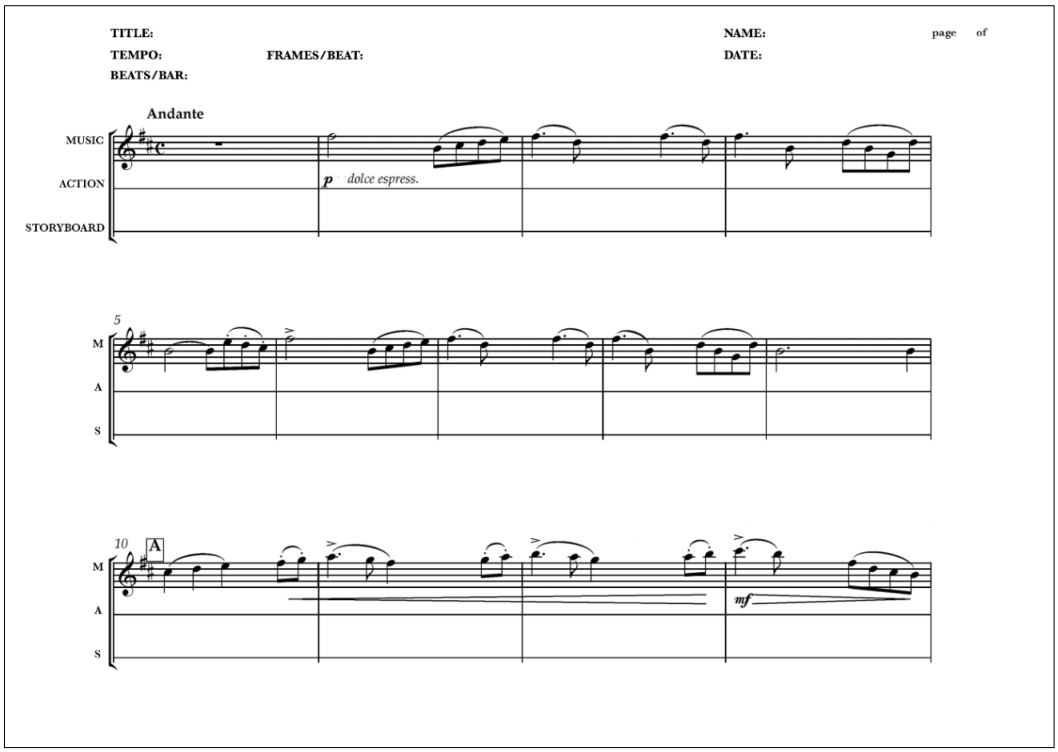


Figure 41: Empty bar sheet for Bradley's "Swan Lake" scene (with some added bars for demonstration purposes) to be completed by the character animators. Image by Author.

Sheet music is not readily available for all music animators will be animating to, as composers of film music use different methods for composing music. Even if the sheet music does not exist, it is possible to convert an audio track to notation using software such as Notation Musician and Intelliscore Ensemble 8.1. Alternatively, the music staff on the bar sheet could be replaced with written information about the musical events (i.e. where melodies come in, where texture changes, loudness, softness and any other musical parameter). For the proposed method, however, it is assumed that the sheet music is available.

It is proposed that the *Khumba* character animators could have followed certain steps after having received the empty bar sheet of Bradley's "Swan Lake" scene.

4.4.1 Steps in using the proposed notation

The process of using the proposed notation starts with performing some calculations and completing the top section of the bar sheet. The animator should then analyse the sheet music while listening to the audio track. This is followed by writing down the actions of the character(s) at specific bars. Thereafter the animator adds the visual drawings or screenshots of the character(s) key poses. In the

final stage the bar sheet can be digitised to allow the animator to follow the music visually and make changes to the bar sheet electronically.

The application of the five steps on Bradley's "Swan Lake" ballet scene will be illustrated next. The musical competencies required to analyse the musical scenes will in each instance be indicated in brackets.

Step 1: Do the required calculations and complete the section at the top of the bar sheet

The first thing the animator should do is write down the basic information about the musical scene, for example, the title "Bradley's Swan Lake Ballet" (refer to figure 42). If not provided, the tempo of the music should now be calculated by listening to the "Swan Lake" music alongside the click track and identifying the main beats (*Musical competency: identify the tempo*). To calculate the beats per minute a watch can be used to count the number of beats in six seconds of music which is then multiplied by 10 to get the beats per minute. Alternatively, an App can be used. For this illustration it is presumed that a steady beat of 80 BPM is kept throughout the "Swan Lake" music as a steady beat does not usually occur in classical music.
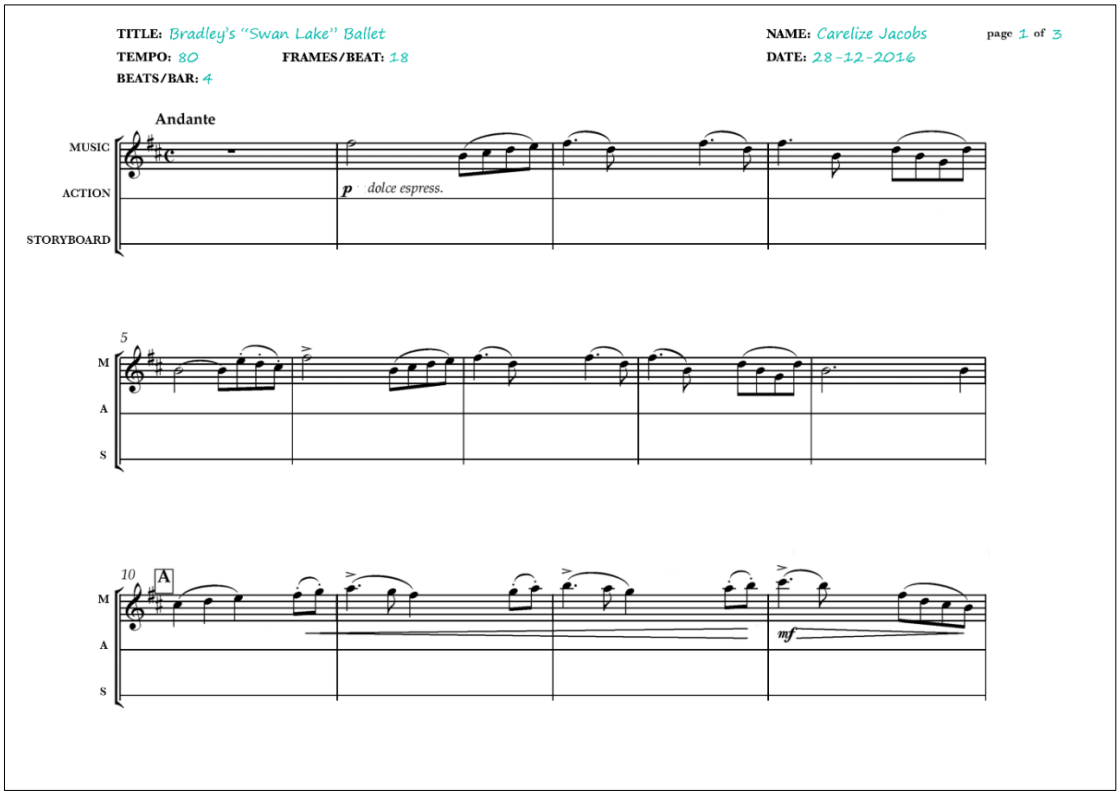


Figure 42: Step one in using the proposed notation for Bradley's "Swan Lake" scene, i.e. do the required calculations and complete the section at the top of the bar sheet. Image by Author.

By using the calculated BPM the animator can now determine how many frames there are per beat of music (*Musical competency: calculate the rhythm*) using the following formula:

24 frames per second (fps) x 60 seconds = 1440 frames per minute (fpm)
1440 fpm/80 BPM = 18 frames per beat

To know the beats per bar one has to look at the time signature of the music. In this case the time signature is 4/4 (C) or four crochet beats in a bar (*Musical competency: music notation relating to duration*).

It is also possible to calculate the total amount of frames for the scene (which can be added on the bar sheet) by multiplying the number of frames per beat by the total amount of beats in all the bars. For the "Swan Lake" scene it is calculated as follows:

Frames per beat x Total beats (i.e. Beats per bar x Total amount of bars)
18 x (4 x 13)
Total frames = 936

It must be noted that musical performances may be on beat (synchronised) or off beat (syncopation) and that the proposed system of notation accommodates both these two kinds of performances.

Step 2: Analyse the sheet music while listening to the audio track

The second step will be to analyse the "Swan Lake" music aurally (by listening to the music), while at the same time looking for musical cues in the music notation on the bar sheet (refer to figure 43).

The word describing the tempo for this piece is "Andante" which means that the music is performed moderately slowly (between 76 and 108 BPM) (*Musical competency: terminology relating to tempo*). The animator would thus not necessarily animate quick movements as it could seem out of place, but would rather animate Bradley's movements according to the indicated tempo.[34]

On the music notation line it is evident that the music is written in a treble (G)-clef which indicates that the pitch will be fairly high (*Musical competency: musical notation of pitch*). Recognising the

[34] Note that terminology relating to tempo may not be as useful to an animator as a precise BMP or click track – "andante" being a vague descriptor of tempo which could refer to anything between 76 and 108 BPM – the exact decision here would be up to the conductor who has the power to decide at exactly what pace to take the music – and also where to slow down, speed up etc.

changes in pitch will assist the animator in knowing whether to animate Bradley performing light or heavier movements. Although some animators might be able to easily perceive the pitch, this is not always the case. The latter group will benefit from the visual representation of the contours of the music provided by the score.

The music begins with a violin tremolo during which the oboe is silent for a whole bar (*Musical competency: noting timbre*).[35] In the second bar the oboe plays the main melody softly, as indicated by the *p* (*Musical competency: terminology relating to dynamics).* The mood in which the oboe should play the melody is sweet but expressive as indicated by the term '*dolce espress*' (*Musical competency: terminology related to mood*). The animator can now deduct that Bradley's movements should not be aggressive but rather subtle and with emotion (something that not all animators might be able to recognise on the audio track alone).

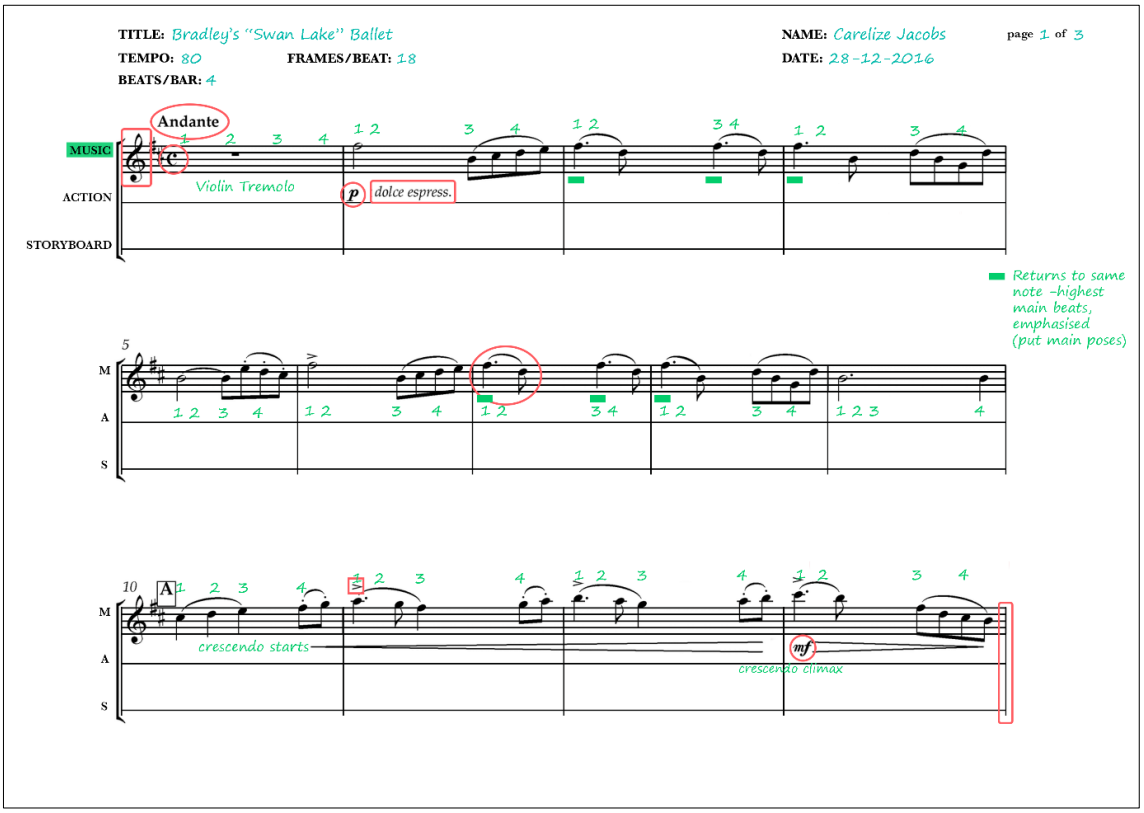


Figure 43: Step two in using the proposed notation for Bradley's "Swan Lake" scene, i.e. analyse the sheet music while listening to the audio track. Image by Author.

[35] Note that although animators would not perceive the tremolo from the score, they would be able to hear it on the audio track.

The music builds from the ***p*** (piano) in bar 2 toward the ***mf*** (mezzo forte) in bar 13 where the music is played moderately loud. One can also see in the notation that the notes goes higher towards the climax at the ***mf***. From bar 10 there is a crescendo which indicates that the music should be played louder from the section pointed out by the letter 'A' (*Musical competency: Terminology relating to dynamics*). The animator can now think of movements for Bradley that will correspond with the music and that grow in size or in scale towards the climax of the music in bar 13.

The repetition of the same dotted quarter note in bar 3 and 4 and again in bar 7 and 8 which falls on the down beat (the first beat in the bar) and the third beat, means that the note is emphasised (as indicated with a green line below the note on the bar sheet) (*Musical competency: notation relating to duration*). This information is useful to the animator as it can indicate the right place to position Bradley's key poses.

The symbol '>' above the first beat in bar 11, indicates that the note should be accented (*Musical competency: Terminology relating to dynamics*). The accent and the rhythmic pattern is repeated in bar 12 and 13, but is played louder and at a higher pitch every time. The animator could now design a few similar movements for Bradley that will increase in size up to the climax.

Step 3: Write down the actions of the character(s) at specific bars

The third step in completing the "Swan Lake" bar sheet, is to write down which of Bradley's actions should happen at what stages of the music (refer to figure 44). Each action should fit what the music portrays. The animator should also write down applicable camera changes and fades. For example, the animator could decide on subtler movements for Bradley where the music is *piano* (soft) at the beginning of the scene. Bradley's movements then build up just like the music and at the climax he performs a grand jump which coincides with the climax of the music. (This example demonstrates a benefit of using the bar sheer as the animator relying only on oral input might have missed this cue.)

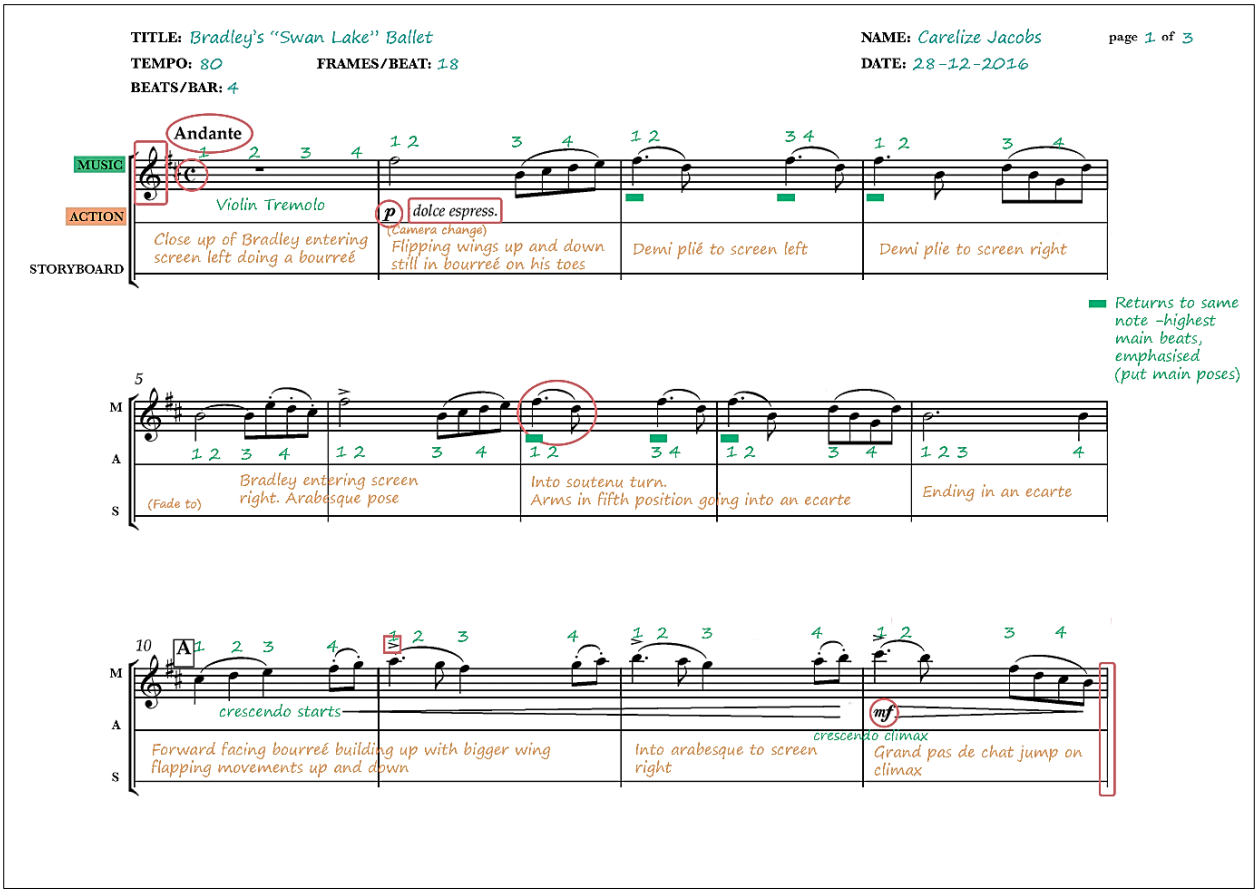


Figure 44: Step three in using the proposed notation for Bradley's "Swan Lake" scene, i.e. write down the actions of the character(s) at specific bars. Image by Author.

Step 4: Add the visual drawings or screenshots of the character(s) key poses

The key poses of Bradley's actions will now be drawn out or frames from the *Khumba* storyboard will be put at the correct place in line with the written down action on the bar sheet (refer to figure 45). The key poses can be moved around or changed during the process.

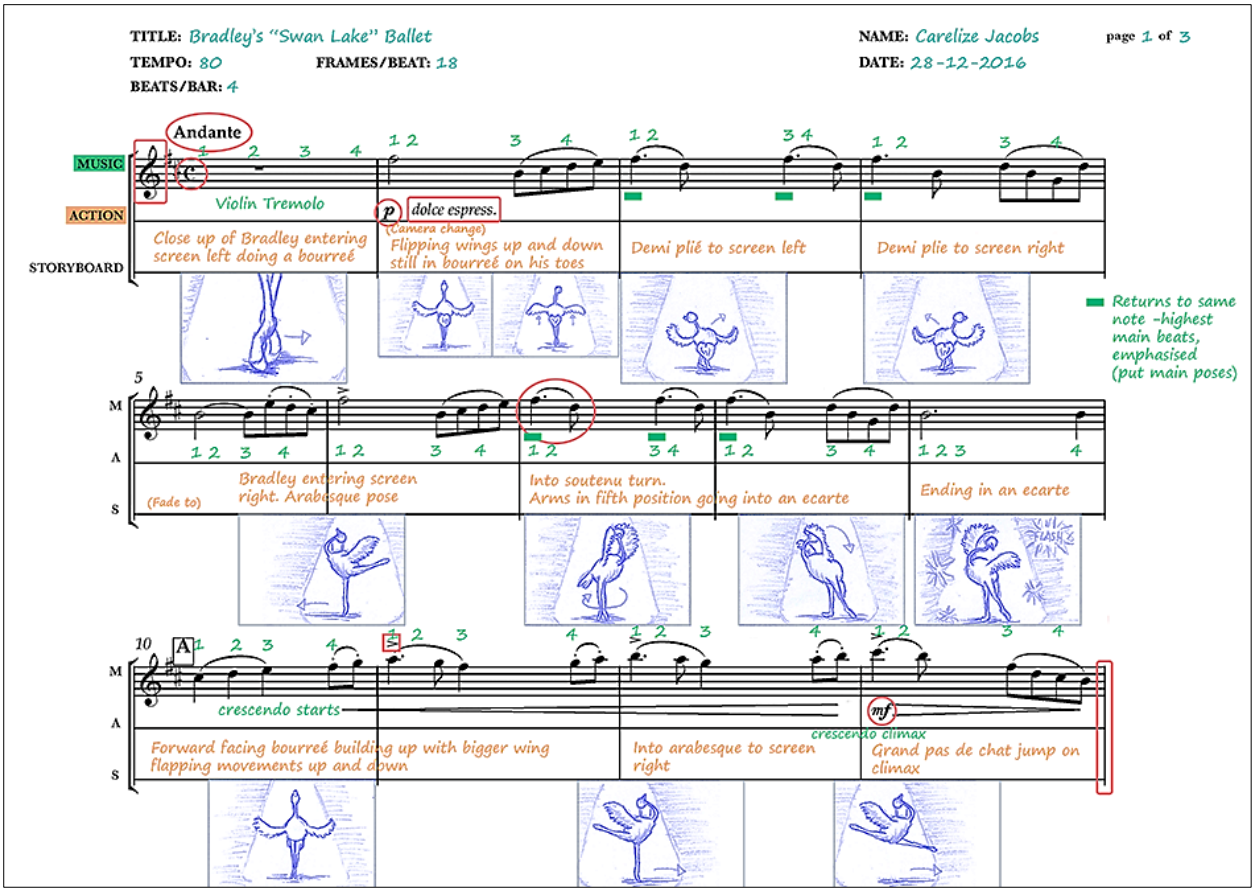


Figure 45: Step four in using the proposed notation for Bradley's "Swan Lake" scene, i.e. add the visual drawings or screenshots of the character(s) key poses. Image by Author.

Cutler, who was responsible for the Bradley's "Swan Lake" scene, was able to animate the scene successfully as she could rely on her dance background and musical competencies. However, by using the proposed method above, she could have animated the scene even more effectively as she would have been able to plan out the scene in more detail. Also, the visual information on the bar sheet would have allowed her to better synchronise the movements to the important notes in the music.

Step 5: Digitising the bar sheet for animation

Even though bar sheets are traditionally in paper format, it is possible to have a computer programme which will allow the animator to view and edit the bar sheet simultaneously, while also listening to

the music. For example, some features of two existing software programmes such as Sibelius music notation software and Adobe Photoshop image editing software can be combined for this purpose.

A video clip demonstration of the digitised bar sheet in which Sibelius and Adobe Photoshop features are combined, can be seen in Video Clip 3 on the accompanying CD.

It is also possible to translate the musical staff on the bar sheet to a digital format to use in the process of animating. Software for animating musical movements already exists, such as the Celtic animation system developed by Sauer and Yang that supports data-driven mappings of musical features to movements (1-15). This system attains the combination of interesting movements and relevant music by using musical attributes to build an animation that fits user's specification and is tailored to the music (Ibid). Unlike synchronisation-based methods that simply alter an existing animation's timing in accordance to the musical beat, this system creates movements based on musical beats and dynamics (Ibid). Although this is ground-breaking work, this system is suitable for songs that do not change in tempo and is also currently limited to Celtic motion, not other types of dances (Ibid).

Another possible programme to use, is Apple's Logic Pro Software. With this software, the music score scroll can be seen together with the images so that one can visualise how the pictures would work with the music (refer to figure 46). Logic Pro is a programme specifically designed for musicians to compose music with. A visual representation of the music being composed can be in the form of a waveform, notation or "piano roll" (MIDI events spread across a timeline). Animation changes cannot be made in this programme, only musical changes, as the programme requires rendered out scenes. 3D animation software exists in which it is possible to see the waveforms of the music.

To see the waveforms can enable the animator to see when the music changes in volume, where the beats and accents appear in the timeline, as well as changes in density and volume, but much more information can be derived from musical notation such as mood, length of individual notes (duration), and clear indication of dynamic changes, (more structure and more information is derivable from sheet music).



Figure 46: Apple's Logic Pro Software showing both the images and the sonic waveforms. Digital image. Apple. "Music and Sound for picture." *Apple*, N.d. Accessed 28 Oct. 2016.

Another suggestion is to develop a plug-in for Autodesk Maya (refer to Video Clip 4 on accompanying CD). It is foreseen that with this tool the musical notation is visible below the existing timeline (refer to figure 47). This will enable the animator to see exactly on which frame what note falls.

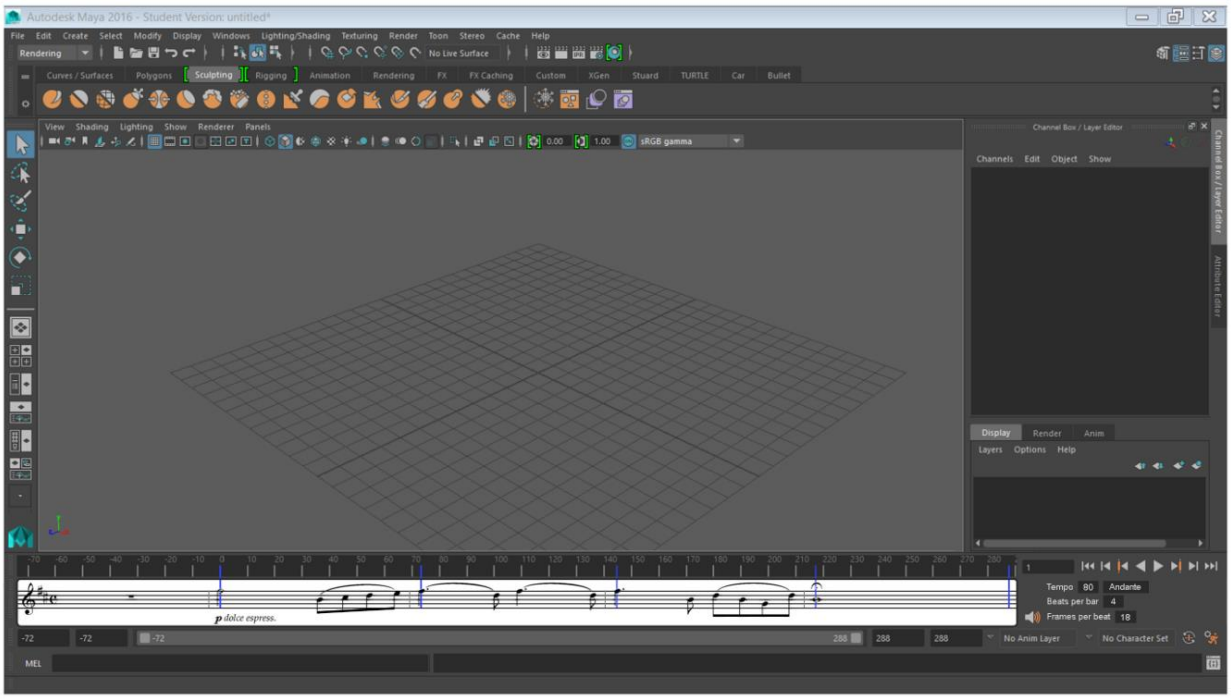


Figure 47: Suggested digitised musical notation incorporated into Autodesk Maya. Image by Author.

The information written down on the top part of the proposed bar sheet such as the tempo, beats per bar and frames per beat, will in this digital format appear on the bottom right side of the screen next to the notation tab which can be taken off if needed (refer to figure 48). It is suggested that a mute button be added to enable the animator to view the notation without the audio. Each main beat (the first beat of the bar) will be indicated by a blue line as can be seen in figure 48. The musical notation will shrink and grow alongside the timeline as the animator zooms in or out.

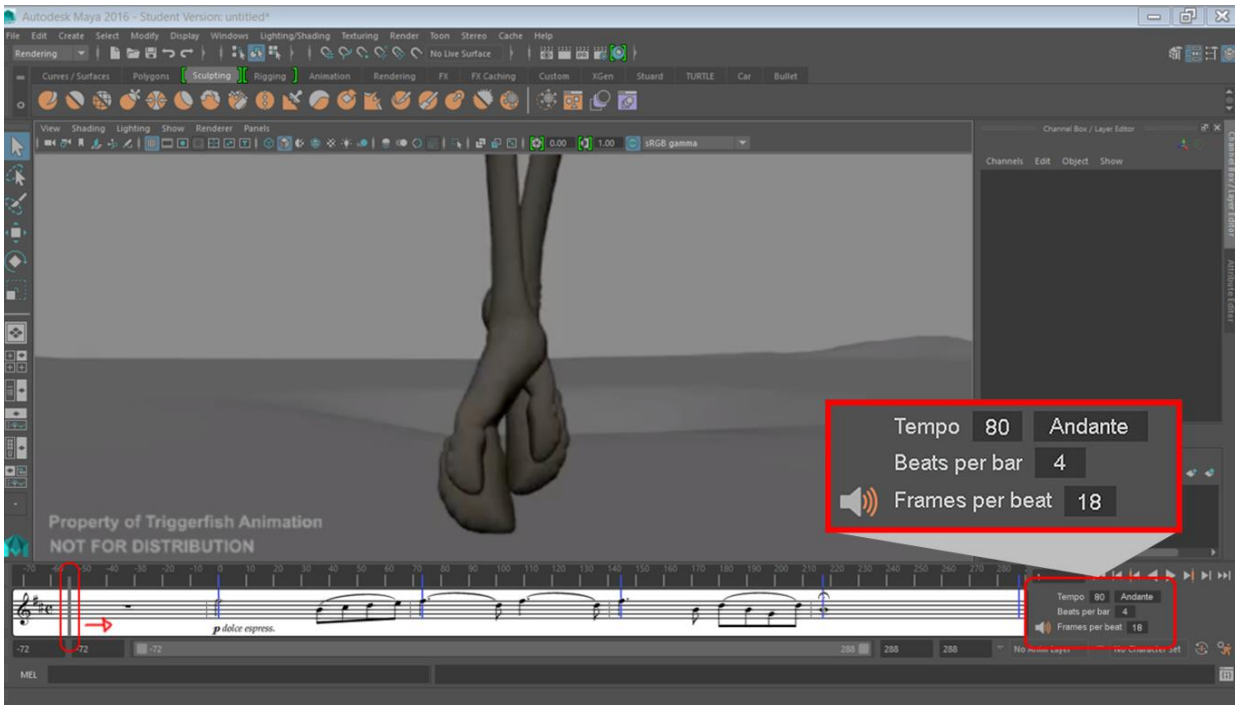


Figure 48: Suggested Maya plug-in with information tab. Image by Author.

The idea is that once the animator presses the render or play button, the slider line highlighted in red in figure 48 will scroll along the timeline covering both the animated keys (which normally happens in Maya), as well as the music notation.

It is envisaged that the slider line in the Maya plug-in will glow on every main beat (the first beat of every bar) where after it will move along in the usual grey colour (refer to figure 49). At every other beat (beat two thee and four) it will fade to a very light grey. The slider will always be in sync with the click track and will automatically change as the tempo changes (something that will need to be programmed into Autodesk Maya's coding).

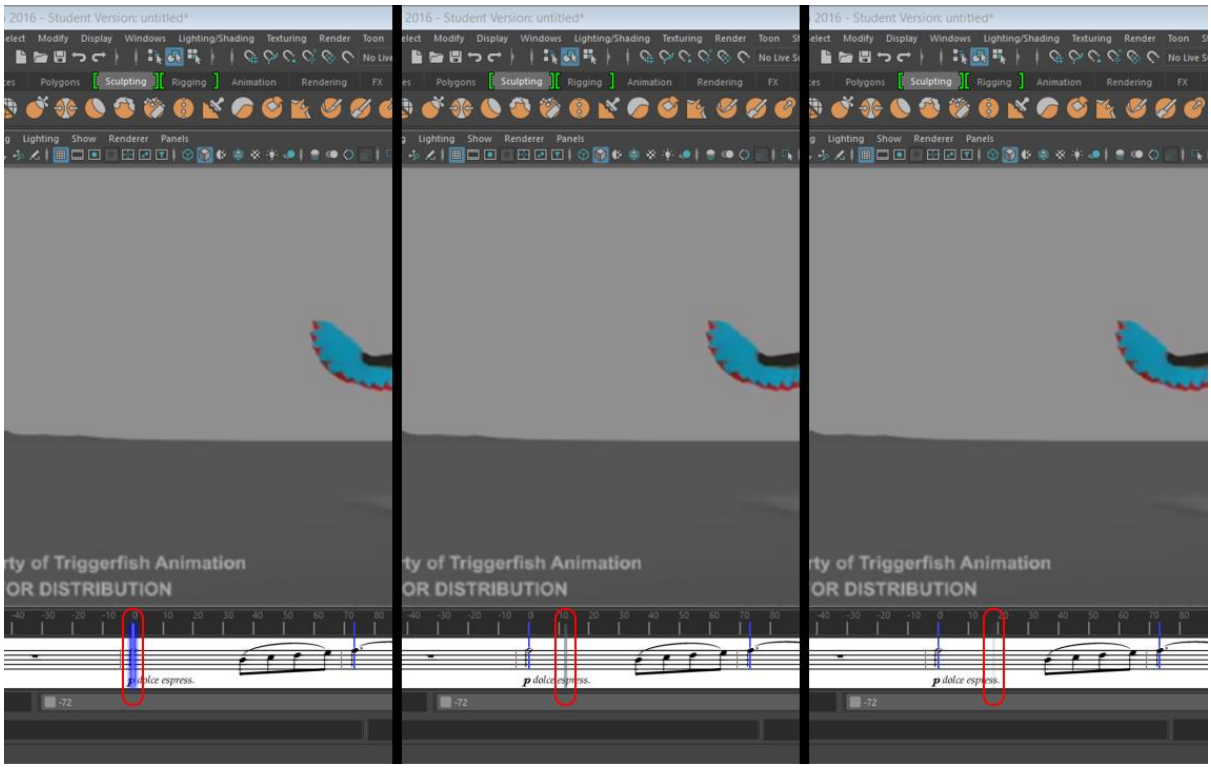


Figure 49: Slider line glowing on main beat, normal between beats, and fades to a lighter grey on every other beat. Image by Author.

4.4.2 Comments from character animators on the proposed notation

The proposed approach for notation was explained and illustrated to the character animators during the interviews. In commenting on the illustration, most animators thought that the proposed method of animating to music would be helpful to character animators. They understood and agreed that in order to use this method, character animators need to have certain basic musical competencies. Lowry, for example, says that what he likes about the proposed method is that it already touches on aspects animators use such as timing, and although musical theory might initially seem intimidating, it is simple:

> What might become scary to an animator when they start seeing musical theory is a lot more obvious when you explain it like you have, that really all it is, is beats over frames, poses over frames, and in this case, notes over frames and how it affects the dance moves and tempo of performances. So, I think what's good about it is that it makes a potentially really frightening, scary, strange subject a little more approachable for animators. (Lowry)

The animators enthusiastically supported the idea of again adopting this old bar sheet technique and combining it with contemporary practices. Some animators, such as Darries, even said that they cannot understand why this technique is not in use any more.

The fact that one can visually see the musical cues in the notation alongside the images was mentioned as a major benefit. Courchay notes that:

> It's often tough to know exactly which frame to hit what note, now if you've got something like that, it tells you exactly the note is on this frame, you know you're hitting it right straight away, instead of just having a sign on your timeline, but very little indication when it's actually hitting it. … If you've got it visually in there, it can be a benefit. (Courchay)

It would be useful to see where the music builds and falls, says Cutler. Croudace adds that some people might miss a crescendo when listening to the music, but when they see it visually it's certainly a good queue to precisely see to what note it builds up. It is especially useful for visual people and that the visual cues would enable them to identify key moments such as crescendos, says Darries.

Lombard is opposed to having a visual reference alongside an audio track as he argues that he only needs to hear a piece of music to figure out its beats, highs and lows and accent points. Although this might be true for animators with a musical background, this is not the case with all animators as not everybody has a natural feeling for music. It is important to note that Lombard has never before animated a musical scene.

Some of the animators interviewed felt that the proposed method may only be suitable for longer scenes. "I would say it would be a huge help for animators who had to do long musical sequences and probably essential to plan the stuff out because the way we planned out the short musical sequences is a similar way, but not driven by the music", says Lowry. Cutler agrees and says: "I think that is helpful especially, if say, the movie is a musical".

Some animators argued that animators do not all need basic musical knowledge since they would most probably never animate a musical production. However, when I mentioned the scenes in *Khumba* which can be considered as musical scenes, they realised that animators would more often animate musical scenes as what they initially thought. Furthermore, the animators agreed that they

do not only use musical knowledge for animating musical scenes, but for animating in general, even if subconsciously.

The other animators interviewed also felt that the proposed approach for notation will be especially helpful during the planning and pre-production phase. Planning, according to Pienaar, is 90% of the work. Snaddon agrees and says that the proposed notation is a nice tool to use in planning a musical scene. Attending to the sound and music with animated film already in the pre-production phase is also, as said before, emphasised by Beauchamp ("Designing Sound 1st Ed" 29).

The animators agree that the music needs to be pre-recorded and be available to the animators already in the pre-production phase. This is, according to Snaddon, important when animating a scene that heavily relies on music. "It probably would help a lot to have the actual music because then you can do much finer correlations to the music … So you can actually much more closely integrate your animation with the music", says Lombard. Darries adds that, "I feel like it would make so much sense to first have that [the music], and then start animating, because that sort of helps bring everything together… it sort of helps bring people onto the same page."

The need for a more coherent production approach as a requirement for using the proposed notation was also emphasised by the animators. Courchay notes that it would be hard to implement the proposed approach in the production process, but that it would help the animator. "Usually composers have to run afterwards, go back, and try and change things to work, which seems like extra work", says Darries. With the proposed approach the composer must be willing to also adapt to the changes in the production process which could lead to less frustration for both the composer and the animator and to a more successful result.

Initially a bar sheet in paper format was used for illustrating the proposed notation during the interviews. However, it quickly became clear that the proposed method might have to be digitised (as was proposed in this study) to keep up with today's technological age. Lombard notes that with computer technology, being able to preview the animation as the same time as the music has many advantages. Pienaar concurs and says that it would be better when having to work with overseas directors. Animators interviewed also made suggestions for how to digitise the proposed notation. Venter, for example, stresses the need to see the beats in a timeline format because it would enable the animator to break down the scene and music into smaller chunks. Most animators, such as Venter,

Lombard and Snaddon, agreed that a plug-in above the timeline in software like Autodesk Maya would offer a good solution.

4.5 Conclusion

It seems as if today's 3D character animators forget that they can learn from past practices and don't have to only rely on new technologies in their search for new ways of doing things. This study suggests that having a certain musical competency set will enable character animators to animate the performance of characters in musical scenes more believably.

In this chapter, an approach for notation which requires musical competencies was proposed for synchronising performances to music and illustrated using the Bradley's "Swan Lake" Ballet scene in *Khumba*.

From my interviews with the animators I discovered:

- Most *Khumba* animators have some form of musical knowledge and skills.
- Most *Khumba* animators agree that they used the musical knowledge and skills they have when animating the musical scenes in *Khumba* whether consciously or subconsciously.
- *Khumba* animators are already using certain musical concepts in animation which have similar meanings.
- *Khumba* animators agree that having more musical knowledge and skills would have helped them in animating the musical scenes in *Khumba*.
- *Khumba* animators all agree that the proposed musical competencies and notation offers a possible solution for more effectively planning and animating musical scenes.
- *Khumba* animators recognise the need for a more coherent production approach for achieving a better result in films with musical scenes.

The animators interviewed agreed that the proposed method might have to be digitised. This chapter proposed and illustrated a plug-in for Autodesk Maya for use by character animators when animating musical scenes.

Conclusion

With this research I aimed to explore the relationship between music and character animation. Even though a significant amount of research has been conducted over the years on film music and animation, these two fields of academic study mostly developed independently from each other. Few researchers in animation and film music have devoted time to the deployment of sound and music in animation, possibly due to limited research on the development of animation after the Golden Age.

This study addresses a need for research that from an animation perspective, will advance the deployment of contemporary production processes for better integrating music and animation. This was achieved by investigating and suggesting the ideal musical competency set a character animator would benefit from to digitally animate the performances of characters for a 3D animation feature-length film to closely synchronise with pre-recorded music. An approach for notation was proposed in which the animator could use the suggested musical competencies. Ultimately, this research can lead to finding a universally-agreed approach for notation in animating to music combining both traditional and new methods and techniques. The research can also lead to changes in the working practices of the filmmaking team and work flow within the production pipeline.

With the proposed musical competency set and approach for notation, a more coherent approach for animating musical scenes (i.e. any animated scene in which a character takes part in a musical performance whether by singing, dancing, playing a musical instrument or any other action which requires synchronisation to music) in line with Powell's broader ideal, was developed. This approach demands greater integration between the key tasks in the production pipeline and will require closer communication and collaboration between the different filmmaking teams, including the animation and music teams, all working towards the best result (i.e. achieving Powell's cinematic ideal of a composed film). This might lead to greater understanding for each other's creative practices and how they fit into the overall process. Towards this end, sacrifices from all sides will have to be made.

For example, the director in the pre-production phase needs to oversee the finalisation and recording of the music, as well as the additional task of developing a bar sheet with an added notation, while the animator must acquire musical competencies and use the proposed method when animating. In post-production, the editing team must work more closely with the animator to ensure that the scene remains as intended.

A qualitative research approach was followed. The research methodology consisted of a historical analysis, studying current practices and the analysis of a case study. The animation feature film, *Khumba*, made by Triggerfish Animation Studios, was chosen as the case study. The purpose of analysing the case study was to highlight the musical scenes in *Khumba*, qualify the meaning of a musical scene in terms of the type of movements to music and length of a scene, describe the music used, and introduce Bradley's "Swan Lake" ballet scene as the scene used for illustration purposes. The case study also introduced the animators who acted as the informants for the research to substantiate the research argument: that character animators can benefit from musical competencies, and that they can apply these competencies beneficially in the proposed way.

The reason why *Khumba* was chosen as case study for this research is because *Khumba* is a South African animation film containing musical scenes. The animators were accessible enough to make it easy to understand the practices and processes within the production pipeline, including how the performances in the musical scenes were animated, and to establish what musical knowledge and skills they have and how they use it in the process of animating.

One-on-one semi-structured interviews were conducted with the lead animators and character animators responsible for the musical scenes in *Khumba.* The study was also informed by interviews conducted by others with directors and the animation supervisors. Open-ended questions pertaining to the animation process and the animators' musical talents and knowledge were asked during the one-on-one interviews, while feedback on the proposed approach for notation was also obtained.

The question I wanted to answer in this research was: What basic musical competencies would have been ideal for the character animators of *Khumba* to have and how can they use it to animate performances of characters to fit pre-recorded music?

To answer this question, I analysed *Khumba* following Crafton's distinction between performance 'of' animation and performance 'in' animation, where performance 'of' animation concerns the filmmakers and audiences, and performance 'in' animation concerns the characters and movements within the film. The performances 'of' animation - how *Khumba* was made (including the process followed to animate the musical scenes) - was presented as informed by interviews conducted with members of *Khumba*'s filmmaking team. The analysis focusing on the performances 'in' animation was done by watching the film and conducting interviews with the animators. The physical movements of

the characters in the musical scenes were assessed, while at the same time the movement of the music as part of the performance was considered.

For the animated character's movements to seem believable, the character animator has to become a performer and act the part. For a musical scene, the animator becomes either the dancer, choreographer or musician. In this instance, it can be said that the character animator is in effect 'musicking'. When 'musicking' to pre-recorded music, the character animator creates visual actions according to a pattern set by the music with the timing of the movements coinciding with the timing of the music and so that the movement and the music both begin and end at the same point and reach their climax together.

Both animation and music are temporal arts. It is therefore not surprising that similar concepts are found in these fields, such as rhythm, tempo, beats, accents, phrase, legato and staccato. This research compiled a set of basic theoretical knowledge and skills in music that might be useful for character animators. This investigation was complemented by probing into the backgrounds of contemporary character animators to establish their views and feelings about the relationships between music and animation as well as their affiliation to music. These investigations confirmed that character animators benefit from musical knowledge and skills when animating performances in musical scenes.

The ideal musical competency set for character animators include knowledge and understanding of some musical aspects of sound such as pitch, duration, loudness, melody, harmony and timbre; some fundamental rhythmic aspects, i.e. beats, tempo and rhythm; basic musical terminology pertaining to mood, tempo and dynamics and; basic notation of pitch and duration. Possessing this musical competency set allows character animators to break down a piece of music into smaller sections, analyse the music in each section and interpret it in such a way that decisions about a character's movements can be made.

In investigating the ways in which various contemporary character animators animate performances to music it was revealed that a universally-agreed approach for notation does not exist. However, a method known as the bar sheet was used by earlier animators. The fact that most of these animators had a basic knowledge and understanding of music enabled them to use this bar sheet method. This study proposes the reintroduction of an adapted version of the original bar sheet for animating the performances of characters in musical scenes synchronised to pre-recorded music. The most important feature of this new proposed bar sheet is that it includes a staff of musical notation which

displays the melody or *leitmotif* (theme) of the pre-recorded music. On most of the modern-day bar sheets this staff has been omitted. Alternatively, in a situation where the musical notation for the source music is unavailable, computer software can be used to transcribe the audio music to sheet music or the animators could be provided with written information on the bar sheet about musical events happening as it unscrolls (i.e. where melodies come in, where texture changes, loudness, softness and any other musical parameter).

This study proposes five steps in using this approach of notation that can be used for animating characters in animated films that are either musicals or, any other feature films that contain musical scenes. Firstly, the animator performs certain calculations and completes the top section of the bar sheet. The animator then analyses the sheet music while listening to the audio track. Thereafter the actions of the character(s) at specific bars are written down. The animator then adds the visual drawings or screenshots of the character(s) key poses. Finally, the bar sheet can be translated to a digital format which will allow the animator to follow the music visually and make changes to the bar sheet electronically.

I have presented a visual representation of what the proposed bar sheet could look like digitally. In addition, I proposed the development of a plug-in to assist the animator with the actual process of animation. This plug-in consists of the musical staff which is placed below the animation timeline and which enables the animator to visually see musical cues while animating. I offered a visual representation of what such a plug-in could look like in Autodesk Maya.

In illustrating the proposed approach for notation to the *Khumba* character animators using Bradley's "Swan Lake" ballet scene and from the interviews in general, various insights were obtained which substantiated my research argument. I established that most *Khumba* animators have some form of musical knowledge and skill which they drew from to animate the musical scenes in *Khumba*. *Khumba* animators confirmed that they were already using certain musical concepts and that the meaning of these concepts in animation are similar. They agreed that having more musical knowledge and skills would have helped them in animating the musical scenes in *Khumba*. The fact that *Khumba* animators develop and use their own methods for animating musical scenes and that none of them knew of or had ever used a bar sheet, strengthens the suspicion that there is no universally agreed approach for notation to use when animating musical scenes and that collaboration between composer, animation director and leads, and choreographer is essential in pre-production with blocking and keys locked down before animation begins. Although some of the *Khumba* animators were initially sceptical of the

proposed approach for notation, they all agreed that it offered a possible solution to the problem of creating a 'composed' musical scene with movements timed to the frame to coincide with the music (Powell's cinematic ideal). While noting the practical realities of producing an animation feature film, such as time and resource constraints, *Khumba* animators could recognise the need for a more coherent approach for animating musical scenes to achieve Powell's broader ideal.

For a more coherent approach in animating musical scenes according to the proposed approach for notation, changes in the production pipeline will have to be made. It is inevitable that there will be a closer collaboration between the different filmmaking teams. Specifically, this study recommends that: (1) the continuous learning efforts of character animators should include acquiring the proposed musical competencies; (2) the composer provides the music in its final form together with the sheet music; (3) the filmmaking team adopts the proposed approach for notation which demands some changes in working practices and work flow within the production pipeline; (4) the director ensures that character animators alongside the director's notes, the previs or animatic, rigged characters, and scene layout, also receive the proposed bar sheet (with notation of melody on the staff), a click track, and the pre-recorded music audio in the pre-production phase; (5) character animators complete the proposed bar sheet (preferably the digital version); (6) character animators use a plug-in as suggested to animate in the production phase, and; (7) that the sound editor or visual editor in the post-production phase line up the music to the animation exactly as the animator intended to or discuss it with the animator before commencing with editing (this did not happen with Bradley's "Swan Lake" scene in *Khumba* which resulted in his actions being out of sync).

Some general recommendations that followed are that universities and other training providers should develop short courses to teach character animators basic musical competencies; that a programme be developed for a digital bar sheet and; that a plug-in be developed for animating software to assist animators to animate to music.

Certain restrictions exist for the proposed approach for notation. This approach is only suitable for animating performances to music, and it should only be used for longer musical scenes, because the musical cues are not necessarily sufficiently visible for a short scene. Furthermore, the notation is suitable for animating only a few characters at a time, and an identifiable melody and its sheet music need to exist for animators to use this approach. At the same time, musical competencies can benefit any animator, not only those animating musical scenes and can assist animators who animate shorter

musical scenes as in *Khumba*. As musical competencies are beneficial to animators in general, it can also benefit animators who animate musical scenes with many characters.

This study was limited by the little experience of the *Khumba*'s character animators in animating musical scenes. Ideally, animators who worked on other animated features and who work for reputable animation studios outside South Africa should have been included. My study may have benefited more if the *Khumba* animators were interviewed closer to the time they worked on the film, as it was difficult for them to recall their working practices in detail. A question regarding the practicality of attending a short course to learn the required musical competencies could further have informed my study. Also, informants may have had a better understanding of what the study entailed had a definition of a 'musical scene' for the purpose of this study been presented to them upfront.

Future studies on this topic may include extending the study to consider the views and practises of animators from various other animation studios. The proposed approach for notation should be implemented on a real animation project, while another study can evaluate the effectiveness of this approach. The study could be repeated in another context, outside South Africa. Finally, the proposed musical competencies can be tested to ensure that it is inclusive of all competencies animators can benefit from.

With this study I in no way imply that the musical scenes in *Khumba* (including Bradley's 'Swan Lake' dance) were not of a high standard. Rather, by focusing on the deployment practices and processes in proposing musical competencies for character animators and an approach for notation when animating the performances of characters to closely synchronise with pre-recorded music, the study presented a method that has the potential to produce better results. These are according to which Powell's ideal could be achieved. By doing so, the study contributed to research on current animation practises and most importantly to the much-needed integration of the fields of animation and film music.

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Appendices

Appendix 1: Interview Questions Guide

Formalities:

- *Participant Information Sheet*
- *Consent form*

Questions (semi structured and open ended)**:**

Involvement:

1. What were your responsibilities in the film *Khumba*? (E.g. Modeling, Character development, Animation, ect.)
2. What particular character(s) did you work on?
3. Did you choose to animate particular scenes or was it assigned to you?
4. Did you animate a dance scene in *Khumba* OR have you ever animated a dance scene in any other animation? Please describe the scenes[36].

Animatic:

5. Please explain the process which was followed to develop and incorporate music into the *Khumba* storyline[37].
6. Was there sound incorporated in the animatic? If so, was it done to the correct timing?
7. Did you use/work from an animatic when animating the dance scenes?[38].
8. How detailed were the musical scenes in the animatic? (E.g. was every movement that had to be animated shown, or was there just a rough indication of what should happen in the scene?)

Animating-to-music:

9. What did you receive that enabled you to animate the particular musical scene? (E.g. musical score, click track, tempt track, character design or personality.)
10. How did you use these tools? (Did you use it in combination with, for example, a computer program or did you work on your gut feeling?)
11. If you received the music, did you listen to it, work from a musical score/sheet music or did you work from both?
12. How did you determine the correct timing of the musical scene? Did you work it out manually (frame by frame) or by acting it out or by using another way?
13. What was challenging for you about animating the dance/musical scenes? Why do you think you struggled? (E.g. did it take you longer than other scenes?)
14. Do you think it is more difficult to animate dancing animals than dancing humanoid characters?
15. Do you know of any specific method other animators might use to animate to music? Please elaborate.

[36] Start with 2nd part of this question if participant was NOT involved in *Khumba*
[37] Ask *Khumba* Lead Animators only.
[38] If YES answer next question, if NO continue with Question 9

Musical knowledge and skills:

16. Do you have any musical knowledge or skills? (E.g. can you play a musical instrument or did you sing in a choir?)
17. Do you have an innate musical talent or exceptional love for music?
18. Do you understand basic musical concepts and how it relates to animation?[39]

The use of musical knowledge and skills to animate musical scenes:

19. Did you use knowledge of music to animate your character more believably? If so, which knowledge and skills did you use?[40]
20. If you DID NOT use musical knowledge or skills, what other knowledge or skills did you use? (E.g. dance ability, etc.)
21. Have you ever used a bar sheet and/or sheet music to animate a dance scene or do you know of somebody else who have used it?
22. Do you understand how to use a bar sheet when animating movement (If not, explain)?
23. Do you know how music was animated in earlier days (If not, explain)?

Proposition of 'new' method:

24. After explaining suggested musical competencies and proposed method: What are your thoughts about this? Do you think with a basic knowledge of music and this method, you would have been able to animate a dance scene more believably or efficiently?

Thank you!

[39] If YES, ask to elaborate, if NO explain it to them.

[40] Only ask if they DO HAVE music knowledge

Appendix 2: Transcript of Interviews

This is a transcript of interviews which were conducted and analysed for purposes of this research. The interviews were held with the following nine animators of whom most of them were involved with the production of the animation feature film *Khumba*. Only two animators were not involved with *Khumba* but were interviewed because they had experience in integrating music and animation in animation film:

- Matthew Lowry
- Nadia Darries
- Daniel Snaddon
- Kane Croudace
- Nico Venter
- Samantha Cutler
- Annike Pienaar
- Paul Lombard
- Harold Courchay

(*Note*: This is a faithful transcription of the interviews. For the purposes of this research report, only the questions and answers pertaining to the research topic are reflected, while the other parts were omitted. This accounts for the gaps in times and, perhaps, the interrupted flow of the interviews.)

INTERVIEW 1:

Interview with **Matthew Lowry (ML),** animator at Triggerfish Animation Studio, who acted as Lead Animator in the animation feature film *Khumba*.

Date: 29 August 2016

Length: 38:51 Minutes

Place: Triggerfish Animation Studio, Cape Town

CJ What were your responsibilities in the film "Khumba"?

ML On Khumba I was what was known as a lead animator. But essentially what that meant was I had two teams of what, 3/4 people each, in each team. And my, first responsibility was actually, character testing, rig testing, in the pre-production phase. So there was a pre-production phase for about a year. And during that time I did animation tests to try and find the character of the characters, to do motion tests just to find out what style of animation we wanted to do, what was achievable. And then a few technical tests on the rigs. As the rigging department developed the rigs, I kind of, you know, we try and break them, give them feedback.

CJ Oh ja, makes sense. So did you animate particular scenes or characters, or were you just involved in that?

ML We animated a few scenes. So there was two of my teams. One of the teams, did a musical scene which was the dancing ostrich around the camp fire.

The other team, I don't think they animated anything musical. But, they animated a lot of the action sequences. And then they also got a few, conversational pieces. So

we got a nice array of, dialogue scenes versus action scenes and then musical scenes as a nice kind of mix into that, because that was different to what a lot of the guys, including myself, had done before. So it really touched on dancing characters and singing characters and that kind of stuff.

CJ That's interesting. Have you particularly yourself ever animated the dancing?

ML So I was involved in that dancing ostrich Bradley scene, to a certain extent. So what the lead animators did was take the direction from the director and try and, get it across the team so that by the time the work gets back to the director, it's gone through a couple of internal reviews. And I tried my best to, to use my very slight musical background to keep the whole thing on beats. Because we were given music upfront.

It was really easy with people like Sam Cutler who has a dancing and musical background. And the other guys really came to the game, ball game as well. Before that I hadn't done anything musical as far as animation is concerned. I'd never done any dancing scenes. And I'm not sure if that many of the team had either. But I could be mistaken. But myself, no. I had never done anything like that. So it was a real challenge.

CJ Do you think there's a reason for not many dancing being done in general?

ML Ja. I think there's a very specific reason. And that's their dancing animation was very, very tricky. You have to keep very strictly to the beats and very strictly to the time, of the music and it's, dancing involves a lot of, shuffling around and specific feet movements and, it's a very tricky thing to get across. What we had going for us was that it was animals dancing. I wasn't human dancing. So, those are easier to get across than humans which the audience would very easily see if you're not getting it right.

CJ Ja.

ML And we've seen a lot of dancing in our lives. In film and on TV and that kind of stuff. So we had that going for us.

CJ Ja. Great. So please explain to me the process which was followed from developing and incorporating music into the Khumba storyline. Was it written in?

ML As far as I know, there was always one or two, I know the director had always had a vision to have music playing a fairly decent part in the, in the show. The gong rocks of the little dassies were right in there from the beginning. And the little chants that they do were also from the earliest revisions of the script, I remember them being in that. And the music obviously of the Karoo has its own kind of very specific feel. So it became quite a unique aspect to the film, the music. And I think it was fairly intentional to have it in there early. I think it was used as a kind of a pick up or to amp up anything to get little parts of the movie more energizing.

CJ Ja, so it was …[intervention].

ML So it was just part of the movie.

CJ Written in. The animatic. Was there sound, incorporated into the animatic and, was it done to the precisely correct timing?

ML So the previs and animatic, were beasts of their own. And as with other forms of being involved in, the end product often ends up quite different to the previs and the

animatic. And the story board for that matter. And on top of that, the final edits might end up quite different to the, the initial animation we did.

For instance, with the Bradley scene, in the editing room, the song was cut a bit shorter than what it was when we animated it. And that actually changed quite a bit of the beats and made it a different kind of scene than what we actually animated too. So yes, the, the story boards and the animatic and the previs all had versions of the music. By the time it got to final animation we had a pretty final version of the music. But it was evolving through the entire process.

CJ Ja.

ML It changed quite often and, that's kind of the nature of the beasts with animation. So you can imagine when dialogue came and the script changes. It's tricky enough. The music changes that you're animating to …[intervention].

CJ Are already animated, ja.

ML It does become a different kettle of fish. But ja, what ended up on screen, everybody was happy with and it worked.

CJ Ja.

ML So that's really the final say.

CJ Great. Would you say that the animatic is like the most prominent guideline for the timing in musical scenes especially?

ML Ja, I mean as you go up the ladder from storyboard to animatic to previs, uhm, things become more tight and more refined. The previs edits is constantly being looked at by the director and the editor and those things become more and more refined. However, nothing is set in stone. None of the previs' that were animated were the bible that we couldn't change from. And more often than not, the previs was vastly different to the final animation because things, as I say, get changed in edits.

CJ Ja.

ML And just during the animation process, animators would come up with ideas and, in particular people like Samantha, who has a background in dancing could bring other things to scenes that maybe the director didn't have in mind or haven't envisioned. So yes, there were guidelines, I'd say previs was the process guideline. We had to do the final product, but it changed the entire film.

CJ Ja. So you didn't have like, especially for the dancing parts, specific movements that was worked out in the animatic?

ML As far as I remember, and he was quite, he was quite open to input for the dancing scene. I remember a lot of the dancing, not only for our Bradley scene, but for the chanting dassies, and a number of other parts being worked out by the animation director Quintin Vogel and people like Sam and people like Jaco and myself, just going into the room with a camera and doing stupid dance moves and looking like absolute weirdo's. But having a lot of fun doing that.

CJ Ja, ja.

ML And a lot of it came through in the end, there's some good footage of Sam with a ballet background doing the exact moves that ended up on screen. So it was really one of the highlights of the film.

CJ That's, that's great. So what were the tools that the animators received that enabled them to animate the dancing? Did they use only the animatic or they, got like the temporary track obviously to animate to, or what did they receive?

ML So with the regular scenes, we'd always receive, a director's video, director's notes on what he did, broad strokes of what he wanted for the scene or for the shot. We'd receive the dialogue, we'd receive previs video and then the layout of the scene. So that's just with the regular normal shot and scenes. In addition to that, for the musical scenes, we did get the music upfront most of the time. Even if it was scratch or temp music. We did get a time code for how beats were, were going to happen. And then like I say, a lot of it was worked out in the, in the video room with the animation director and, the lead animator, and then the animators. So ja, when they handed over the shots, you get a lot of, a lot of input as to what the director wants, but a lot of it comes down to the animator himself and his vision for the shot. They work, they worked out, I'd say at least 50% of what ended up on screen was the animator's own kind of imagining and workflow and acting and creativity. The director and the animation director can only go so far to say what they want. Then it's the animator's job to keep in that vision, but make the shot your own.

CJ Ja. Definitely.

ML So I'd say the stuff that was handed over was exactly what we needed to then take it forward and make the shots our own.

CJ Who worked out, you just said that, you received like the timing and stuff. Who was responsible for working that out?

ML So the, obviously for the musical stuff, there was a musical director, a music composer named Bruce Retief. And obviously he had huge influence with the director and to how the, what kind of music they were going to use in the film. From there, it was an easy process of handing over the scratch tracks, working out the tempo and then doing the maths to work that into the twenty four frames a second kind of animation stuff.

CJ So the animators did the maths?

ML Ja, I mean it's not really that complicated. But, for people like me who struggled with maths in school, maybe it was a little bit more complicated.

CJ Ja, ja. So you listened, you received a temp track, but you didn't get sheet music or anything that you worked from. It was just audio or video?

ML I can't remember. I don't remember getting any sheet music specifically because the stuff was very dance orientated. It was really about the beats than the dance moves themselves. I'm sure that stuff could have been requested if it was needed by anyone. I don't know, I was in a band and I played guitar for years, but I can't read sheet music. I don't know if anyone else in my teams could read sheet music. So it might not have been that useful to us.

CJ Ja, ja.

ML I'm sure it could have been provided if necessary.

CJ Okay. What was specifically challenging about working with that particular musical scene and why do you think you struggled with that?

ML The Bradley scene, the dancing scene, I don't know if it was a huge struggle more than any other shots. But it was a challenge. I suppose an obvious answer is that no one had seen a dancing ostrich before and what is that look. A lot of dancing happens with the arms, and he has wings. So what do you do with the wings and how do you translate a dance move to an ostrich dance move? Like I said, that's all stuff that happen on the [indistinct] and animators worked it out and decided, came up with a solution to translate the musical dance number into an ostrich dance number. On the other hand, you look at the, the ballet section of Bradley's dance and for me that seemed like one of the most fluent pieces of animation. And that, I think you can attest to the fact that Sam is a very good ballet dancer. She knew exactly what she was doing, regarding the moves themselves and she's a very good animator. And she's passionate about dance and music. So that really came through very well. Whereas maybe with the ostrich dance scene, we had people like me who can't dance to say the least. Maybe you saw a bit of the awkward flailing limbs and weird dance moves coming through, which in itself has its own character I suppose.

CJ Okay. And do you have like a specific method or workflow that you go about when animating a dance scene, or is it just like you just said, getting reference footage, playing around, seeing what works and then taking it from there.

ML Ja, I'd say, more than any other type of animation, reference footage is important. You can look back at the early Disney stuff of the dancing princesses and see a reference to that stuff properly.

CJ Ja.

ML Because I don't know how much a 50 year old Disney animator can dance like they dance in those shows. There was a lot of reference used. Sometimes to the point of, I don't want to say rotoscope in a bad way, but they heavily referenced the dancing footage. And for scenes like that, it's not always a bad thing. And they did amp up the animation with slightly more twelve rules of animation, that type of stuff. But some of it is very rotoscope. And again, not a bad thing.

CJ Ja.

ML Uhm, just to go back to your initial question, about the method. So the method itself I would say is heavy, heavily referenced. And then very specific blocking, because if a dance sequence gets away from you, it can get very messy. I'd say the straight ahead method of animation would be tough to use on a dance sequence.

Because you kind of don't know where you're going. You're finding your way with straight ahead. And with blocking and pose-to-pose you have a bit more of a structure to your shot.

CJ Ja, ja.

ML So I'd probably suggest a pose-to-pose, heavily blocked, heavily planned out, heavily referenced kind of workflow. That said, somebody that knows dance moves and that can dance themselves might find a straight ahead method more free and more kind of energetic than the latter, when it comes down to the animator.

CJ Ja. To animating. So you just said you played guitar in a band. Is that your only musical skill and?

ML Ja, I mean I sang and played guitar horribly for a number of years, but I played. I was forced into playing recorder when I was very young.

CJ [laughing]. Weren't we all.

ML We all have that part of our lives. I played keyboard and piano and that kind of thing. And both my parents are very musical. And I love music. I've listened to it my whole life. So I've had an upbringing in music. Which I really appreciate. But as far as my skills, they are limited. But I enjoy it anyway.

CJ Ja. So you, don't have theory skills like you said no note reading stuff.

ML Absolutely no serious skills whatsoever.

CJ So it was self-taught, guitar and …?

ML I suppose you could say self-taught. Uhm, I had a, guitar teacher who I frustrated for a few months. But ja, like lot of the guys they just download stuff off the internet of few videos. That was the fine way. I'm sure that I would be a lot better if I actually practiced and learned to read music.

CJ Do you understand basic musical concepts?

ML The very basic musical concepts?

CJ The very basic.

ML Sure. If you went beyond that, you'd probably be speaking Greek to me. Which I should understand because I'm Greek, but I don't.

CJ Oh, really? That's so interesting [laughing]. Okay, well, I'll give you this. And just, I'll just go through it with you now. So just a few terms in music that relates to animation terms. It's terms like timing which is obvious, musical timing and then performance timing.

ML Mhm-mhm

CJ And also, tempo which we can, in animation terms we can relate to pacing and stuff like that. And then rhythm, which is obviously timing and, is worked out in frames per beat. So that's just basic musical, things that also comes through in animation and all that.

ML Right.

CJ Before I go on with that paper, do you think you used any of your musical skills to animate the characters more believably?

ML So I had, when you got in touch with me to begin with, I thought about it, because I wanted to give you something that you could use and, I've never really thought about the connection thoroughly. I think deep down, there's some part of me that understands the benefits of being able to keep a beat. And that's one thing even now I don't have fantastic musical skills. I know how to keep a beat. And essentially like you've just mentioned, tempo and rhythm, and those kind of things, influence your musical ability but your animation ability as well.

CJ Ja.

ML Timing and spacing are very prevalent in animation. So hopefully subconsciously, having a bit of rhythm myself has helped my animation, and it is important to understand the importance of variety and rhythm in animation, so that your animation doesn't come across as monotonous and having the same tone and the

same tempo throughout. There's something a couple animators I've listened to, over the years say about a shot where, a shot is a smaller version of a scene and a scene is a smaller version of a sequence. And the same rule applies to each that you build your shot around the one main important pose, storytelling pose.

CJ Mhm.

ML But for me you also build your shot. And the same applies to a scene or you build your scene around an important event or aspect and you build your sequence around the important scene, etc. And I'd say that the same applies to the, you build your shot around an important rhythm and that rhythm has a crescendo and it will, if you have the same volume level, if you want to put it that way throughout your entire shot, through your entire scene, it's going to become monotonous for the audience. So there are definitely abs and flows in shots in scenes and sequences that hopefully came naturally to people that have a bit of musical background. And I suppose if they didn't that's what the director of animation lead and the animation director are there for, to help influence slightly more musically challenged animators. So I suppose if you think about it that way, ja, musical tempo and musical rhythm or beats even if it's a bit subconsciously or indirectly.

CJ What other skills would you say you used? Like I know for instance Samantha will say the dance skills. What do you think you, what other skills that you might have used.

ML Let's see. I can juggle.

CJ [laughing]. Can you really?

ML So basically, I think the most important skill the animator has is, like being a closet actor and I mean that in a sense that I, if you put me in front of a camera I will literally melt. And seep into the ground and you'll never see me again. But in front of a camera with a friend, knowing that that's never going to be seen by the general public, we have a lot of fun. So I think, I'm an introvert by nature, but being able to turn a switch and become a bit of an extrovert and being able to switch off your cringe, embarrassment factor, becomes really important. I'd say a lot of the guys I talk to, they're really shy introverted kind of guys, but they have that ability when it's necessary to become a bit of a class clown.

CJ Ja.

ML And dig into themselves and their life experience and become really actors, besides behind the scenes. So I'd say that was something I learned over the years to let go of my shyness and, and draw a life experience and become a bit of an actor.

CJ Ja. That's, ja, like Disney who had performance classes with the animators and such.

ML Ja, we actually did that on Khumba as well. We brought in a coach and we did some really bizarre and weird acting exercises that was, I'm so glad they never filmed that. It was shockingly embarrassing.

CJ [laughing] But that's good. You need that. Have you ever used or heard of a bar sheet to animated dancing?

ML So I'm thinking through all the animation sheets I've come across and is that anything to do with, the ex sheet?

CJ It's, a bit different.

ML Okay.

CJ Whereas the ex sheet is used more for vocals and such. Which will be in the dancing that you used will be relevant. But a bar sheet is more, everything is timed out in bars. I'll show you now.

ML Okay. Okay. No, I haven't come across that.

CJ And do you know of anyone who uses it?

ML No, I don't recall that, but it's definitely something I should put some research into for the next time I get a musical.

CJ Ja. I'll give you my suggested method now.

ML Fantastic.

CJ Okay. So you probably, obviously Disney has a big influence on us animators.

ML Mhm-mhm.

CJ And, in those days, synchronized sound was, well animations was first animated and then the music was put to the animation afterwards which didn't have a very successful effect, but Steamboat Willy came out with the first synchronized sound and it was amazing. But then, Disney and the animators like searched for a better way to animate to music, and one of the animators, specifically Wilfred Jackson, who had a basic music, musical knowledge suggested that maybe you can use like the metronome and combine that with something visually that everyone can see and work from, where then the animators and the music department, instead of working separately combined their efforts and worked from one central place. And they then came up with the bar sheet.

ML Okay.

CJ Which, like this one is also ex sheets, but in a sideway manner where they had written down the letters and such. So this is, different bars, which will have a certain amount of frames in and, you know, to work out the timing and such.

ML Right.

CJ So this is where it began. But then when they animated, they started writing the actions and such on the music sheets itself. So to see where something happens in the music, they have, okay, here he says this or does this. So on the music sheet itself, and then later they got a more complex thing and, they still had the music, but then more actions were written down, more camera views and how it's going to change and such. But then for some reason, the animators decided that they didn't need the music on this bar sheet anymore. So they kept the format of having the bars, but they thought they didn't need the music anymore. So they have then, the set amount of drawn up frames or from the storyboards, and they will have the actions and so do the things. So now this is problematic because this is what they are working from now. No more music, not even a musical bar to write on everything. They just write down the scenes and what happens in each scene. Okay. Now I'm proposing that character animators should have like a basic sense of musical knowledge.

ML Mhm-mhm

CJ So I'm going to use the specific, the, the scene where Bradley did ballet to Swan Lake as an example to demonstrate this method that I think will work.

ML Okay.

CJ So, this is Swan Lake obviously written by Tchaikovsky and it's written for an orchestra. So this is the orchestra notation. And I'm not suggesting that you need to know how to read orchestration, because that's not going to work at all and, obviously when it ends like this, it's not, ja.

ML Right.

CJ And this is about twelve pages long, but obviously the main theme of Swan Lake is, that [singing].

ML Mhm-mhm

CJ And, so that main theme can be summed up by, it's specifically an instrument that plays it so, it can be summed up like this as well and like shorter, more understandable music, but we only need the main theme which is this one piece of paper. So from twelve pages to one, which is what the animators then animate it to. So I'm suggesting that character animators should know, basic terminology of, things such as, andante… which is the tempo and how it should be played. And then of a dynamics which you will possibly know. Correct me if I'm wrong. Like P means very soft.

ML Okay. I got you.

CJ Piano. And F, very loud.

ML Okay.

CJ And then also, like this is mood terminology. That says for instance it must be, swiftly but very expressive.

ML Right.

CJ So, then just to know that's a higher note than that one and also the, the beats, time signatures, so that you can know that there is supposed to be full beats in that bar. That will also be made easier if you receive, with this, I propose that you receive an audio track and then a click track which points out the beats to the animator. So, then with this, this a new type of bar sheet will be drawn up which will look something like that. We will have the title which will be, 'Bradley's ballet scene'.

ML Mhm-mhm.

CJ The tempo will then be, we will be able to work it out from, you know, having the beats per second by having the beats per second and, working out the tempo. From there we can then work out the frames per beat as the math part of the thing. So ja, tempo is obviously beats, per minute and then by dividing the beats per minute by the frames per beat, the frames per minute which is obviously twenty four frames by sixty, which we work in, then you will be able to get the frames per beat. So then we will say for instance, there will be fifteen frames in the first, well, ja, that's not much, by five frames per beat.

ML Okay.

CJ And then you can work from there. So then I suggest that, okay, so this is a bar and each bar will then have four beats in which is indicated by the time signature there. And then, the animator can write down the action and, what must happen in each frame while seeing and then hearing the audio track along with the storyboard, initial storyboard images which maybe shows him making, ja, I don't know, going on his toes

or turning around and doing a civil and such. So in this matter, the reason I'm, suggesting that we rather use this method instead of just trying to get everything, from everywhere, is because of, here you can see everything on one page. You can always refer back to it and you don't forget that you've written something down somewhere and, I know that we're living in a digital age, so this will probably be digitized and being open for changes and such. And maybe you can, even be shown along maybe put in the bottom of a frame where you can see the reference footage. And then you can, according to the beats and bars, animate more, hopefully more believably.

ML Well, that makes sense. I think you've delved into the stuff way more than any of us could.

CJ [laughing].

ML And I think, by accident and because our sequences were quite short, we got lucky and were able to do it by ear.

CJ Mhm, ja.

ML However if we were animating a lot more musical sequences or a musical animation, I think this kind of stuff would become absolutely valuable because like you say, knowing what actions happen over how many frames is part of animation as it is. And for an animator who's not very musically inclined to know how vocals or dance moves would happen over music, might become very tricky. So I'd say, ja, I mean this layout seems completely, obvious and makes sense to me. I'd say it would be a huge help for animators who had to do long musical sequences and probably essential, to plan the stuff out because the way we planned out the short musical sequences is a similar way, but not driven by the music. It was driven by our ear and that's why I say I think we lucked out that we got it on beat and we got the right actions and the right frames and drew on people's experience like Sam. And that's why she was given the dance sequence. Whereas if you had given me the ballet sequence, it might have come out rather ugly.

CJ [laughing].

ML So this kind of stuff, ja, I completely agree with your reasoning. That's way more in depth than I'd ever thought about it, but makes a lot of sense.

CJ So do you think then with this, suggested basic, very basic musical knowledge that the animators would have then –

ML Well, what I like about it is that it touches on stuff that we already as animators use and have which is spacing and timing. Poses per second, frames per second. It's not actually that different to what we know. And what might become scary to an animator when they start seeing musical theory is a lot more obvious when you explain it like you have, that really all it is, is beats over frames, poses over frames. And in this case, notes over frames and how it affects the dance moves and tempo of performance. So I think what's good about it is that it makes a potentially really frightening, scary, strange subject a little more approachable for animators.

CJ Mhm. That's great. Well that was really, really helpful. Thank you so much. You're more than welcome to keep this as well.

ML Fantastic. I'm going to show my dad because he and myself collect musical memorabilia.

CJ Oh, really?

ML And on top of that, animation memorabilia. So this is like a nice combination of both.

CJ Ja. So you're more than welcome to keep that and please email me if you think of anything or any insight that you might have or any suggestions.

[END OF RECORDING]

INTERVIEW 2:

Interview with **Nadia Darries (ND)** an animator at Triggerfish Animation Studio. She was not involved in the animated feature film *Khumba*, but is currently working on Revolting Rhymes (which also includes dance scenes).

Date: 29 August 2016

Length: 23:31 Minutes

Place: Blue Route Mall, Cape Town

CJ Have you ever animated a dance sequence, or a musical scene?

ND In college.

CJ Can you describe the scene?

ND With this little boy dancing on a wall, like on the side of a bridge, this little vicious state side camera, and he was just dancing from scene to scene.

CJ Was it a long scene?

ND I'm not sure, it was like three seconds.

CJ Was the whole scene written into the storyline of the … ?

ND Ja, well, it was planned.

CJ Was it planned beforehand? And did you plan it out on an animatic, or was it in a storyboard-like plan?

ND Animatic.

CJ And how detailed were the movements, like the specific dance movements in the animatic?

ND Well, actually, that was completely based on like recorded reference. So we just recorded reference of us dancing, really at this particular beat, particular tempo, and then just use that reference then.

CJ Mm.

ND I'm actually animating small little dances right now. I forgot about it.…

CJ Is it?

ND … at the moment, ja.

CJ What, what does it entail?

ND It's just two small little guys, like I don't know, very …, sort of like dad, dad dances.

CJ Oh ja, awkward sort dancing?

ND Ja, so it's, it's like, it doesn't really need to be in, you know, in tune with any music, or whatever, you know.

CJ Did you choose to animate those scenes, or were they given to you? Is it? Did you choose to do them?

ND Ja, I also decided to make them dance.

CJ Oh, so it was a choice?

ND Ja.

CJ That's interesting. Did you, because some people say that animating dance scenes are harder than just normal animation scenes.

ND Why do they say that?

CJ That's why I'm asking you. And some, they say that it may be challenging because to get the rhythm right, and the legs move at a certain tempo, and the arms don't always move together, so to offset that?

ND I think maybe why, I would imagine it, the reason why I think it would be hard, is like, as opposed to any other physical like, because in dancing, it's pretty physical. So like if you're going to, I mean, the running … If you're like animating a guy doing parkour, for instance, I think dancing is different because if they, usually it's based on a particular style of dancing that exists in your life, and you know, you're not just trying to convey, or trying to achieve like physics that makes sense, but you're also trying to achieve that style of dance, and you know, you need to keep that particular kind of dance. So it's like a different aspect that you need to consider, like if you don't do that dance yourself, it's just like another thing that you need to imagine that, you know, as like an extra challenge.

CJ Ja.

ND I think, to me, that would, that's why, why it would be more difficult.

CJ Okay. And what did you use, to animate the dance scenes? Did you get like, for instance, I propose that you have a pre-recorded, well, you need the music obviously, to animate a dance scene, did you have the music for that dance scene with the little boy on the wall?

ND I didn't, but …, because I ended up making the music myself, so I just kept to a certain tempo, so that it would fit, you know, there would be animation with the music was at that tempo, so that it kind of fits, you know?

CJ Ja, ja. So you turned the process around?

ND Ja, ja, yes.

CJ Which also works. So did you use like a click track? Basically they do make sure …that the thing's on a set beat. Then just an interesting question. Do you think it would be harder to animate quadrupeds, as opposed to humans?

ND Dancing? Ja. You know, because when you're animating, you're basically imagining what you're doing, you know. It's just like you're trying to imagine how this person or character would move, you know, in order to like act out this particular action. And obviously, we aren't animals, so I think it's harder to relate to an animal and that, to imagine what they would do. So I definitely think it's more challenging.

CJ Ja. And do you know of any specific method that animators use to animate to music?

ND You mean, besides putting it in your scene and …? I think some people would play it by ear, by like listening to, you know, when the, sort of the crescendos and whatever else, is. If I, for me personally, I would, it would be very visual for me. I would listen to the song, get a feel of the sound. But it would be sort of more visual for me. I would look at the, the wafs… you know, … on the down line. I mean, that's what indicates whatever I do. You know, if it's not like a super-crazy, messy song, with lots of different sounds that like indicate whether it's a hits, beats are and stuff. So I mean, I guess that's all I can say.

CJ So, you look at the, like the wafs, like you said, will you look at the sheet music… to indicate that? Or would you just …?

ND No. I mean, I guess because you know, even if I could read sheet music, it's not like we receive it in that format, you know what I mean? We just get the track.

CJ Ja, ja, ja.

ND So, ja, I mean, also, like you know, if you do get the track, you just need to, once you know what the tempo is, and you know which moments are like the crescendos, and that, I don't know what the opposite crescendos is.

CJ The decrescendo.

ND The decrescendo, so …, where those moments are. Then, you know, it's good enough, well for me.

CJ Do you have any musical knowledge, or skills?

ND Ja, music is one of my passions, but I mean, I'm not a learnt musician, you know, taught musician, whatever. I'm just a bedroom musician, so it's a big part of my life, always been there.

No, I do think that it has benefited me in animation. When I started out at the beginning, my first supervisor, he said, that he picked up that I was quite sort of atuned to timing, and like natural, like affinity, or natural sort of feel for timing in itself. And I think it might be due to like, you know, musical passions, etc., whatever, …

CJ Ja.

ND … which has …, I mean, that sort of, that feel for when things …, because animation is, sort of is like, you know, these dips and these highs, and it is quite beat-based, emotions are happening beats, and actions happen. You know, it's like a starting and end point, and music was that as well, and music like, you know, the starting and end point in music, and the highs and the low, said "Ooh, like it's all too sort of …, you know, you get a feeling." And it's the same with animation, you know, different actions exist together, to convey a feeling. And I think in that way, you kind of, there is a relationship that exists, ja.

CJ What instruments do you play? I am taking it that you sing? Then, do you play any instrument with this?

ND Guitar. It's a little around everything, but I mostly play guitar.

CJ Is it? And was it self-taught?

ND Ja. And I'm not very good, but …

CJ Ja, no, but that convinces me you still love music, you love it.

ND Ja.

CJ Do you understand basic musical concepts?

ND Like …, what do you mean?

CJ Like, for instance, you said crescendos, stuff like that, basic terms and stuff.

ND Maybe, ja, like basic, basic stuff.

CJ Basic, basic?

ND I probably, I did my Grade One piano or you know, Grade One guitar, so I can sort of do the basics, you know.

CJ Ja, you just need …, okay, well, I have this sheet for you, which has a few interesting terms that relate …, I'll talk to you through this now.

ND Mm.

CJ It's …, I just want to tell you about a few concepts that are similar in animation music, that we don't always think about, but it's actually quite obvious. So, timing. It's obviously the first one. Musical timing's really the same as performance timing, and everything. Then, tempo, which can be seen in animation as pacing the animation, and to what beats per minute you're doing it to. And then rhythm, which relates to your timing, and stuff, and which can be worked out in frames per beat.

ND Mm.

CJ So, there is a method of working out frames per beat, which are indicated there, as well.

ND Interesting.

CJ It's just by, ja, indicating, using the frames per second, which is obviously 24 for us, in South Africa, by 60 seconds, which gives you the frames per minute then, but to get the frames per beat, you have to divide it by the tempo, which is the beat per frames, and beat …, ja.

ND Oh, the tempo of the music track?

CJ The music, ja.

ND Oh, that's cool.

CJ Ja, and then you can get the twelve frames per beat, which is, ja, something else. I'll demonstrate now how that fits into my whole thing.

ND Okay.

CJ So, do you think that you use your musical knowledge, conscious or unconsciously, to animate your characters?

ND Oh, I think it's unconscious.

CJ And so, you said you used the knowledge of like timing and such. If not the musical skills, what other skills do you think you use? Like I know for instance, Samantha uses her skill of ballet and dance, to animate her musical scenes.

CJ What other skills …?

ND She animated her ostrich doing ballets, so …

I don't know. I guess, I mean, it's not about those own skills. You usually draw on your experiences. I can't call on any skills, to be honest. I just, you know, draw from experiences. I won't say I'm a skateboarder, but because I like being on a board, but I'm not a skateboarder, I would want the skill.

CJ Ja.

ND But I can draw from being an introvert, you know, I could draw from being being awkward, you know, draw from those sort of qualities.

CJ Ja, ja, ja.

ND Like, I don't, I can't draw from any skills, really, that I know.

CJ Okay. And have you ever used or heard of the bar sheets, to animate music?

ND To animate music?

CJ No? And, okay. So now, so let me tell you a bit about animating to music in the earlier Disney days.

ND Mm.

CJ So, obviously Disney had a big influence, especially on the music side, as, in before synchronised sound. The sound was only done after the animation. But then they figured out, "Listen, this is not working nicely, it's not correlating." And they started to do synchronised sound, which cannot …, with "Steamboat Willy" and whatever. And then, but then Disney and the animators felt that there must be a more productive way of animating to music, where the musicians and the animators can work together. So Wilfred Jackson specifically decided "But let's use the metronome." The metronome is a constant beat. The musicians can work to it, like you said, and then the animators can also work to this constant beat. So they drew up a bar sheet, which was actually done on music paper as well, … which they indicated all the beats, and then the animators would write on what happened, in each beat. And for instance, if there are like vocals and stuff, that will be indicated on …, how many frames will be indicated, ja, on the beat. And they will then both work from this central point. So the musicians will, when they edited something, they will add it on to here, and then the animators will only work from here, so they have a set piece to refer back to. Then obviously, ja, it changed to …, they began writing it down on music paper. So when the musicians wrote down their like scores they coming up, came up with, the animators will write down what should happen, and they used these bars and measures kind of, as a reference for how to, ja, go about animating. It then later changed to more, ja, a formal sideways layout. The music was still there, more

detailed, but more compact, and more details were added about like the camera, and the actions, and how everything would happen, …

ND Mm, mm.

CJ … in the certain amount of bars. And then now lately, they've come up with this type of system. But as you can see, the music isn't showing any more, and they, but they still use then current like screen [inaudible] or just storyboard images for what's fra …, actions should happen where, and then still using this bar as outline. But now we're sitting with a problem today, with today's animators, as they use only this. So you can see the music, musical bar stops, fallen away completely. And for me this is a bit problematic. But ja, you'll understand why. So this is where we're currently at. So I'm proposing to go back to Disney's way, but with incorporating new, new methods. In those times, animators did have a basic sense of music, which was quite interesting for me to pick up, and so ja, I'm suggesting that animators must have a basic musicality. Okay, sorry.

ND I mean, like sound and music, is like half, 50% of the film.

CJ Mm, no, definitely.

ND Makes sense.

CJ So, this is …, okay, I'm specifically demonstrating this with, by actually using the scene of "Swan Lake," where Bradley dances just the ballet. And okay, so this is the original score for the "Swan Lake." But I'm not suggesting that you know how to read orchestration, or anything. So this is 12 pages, and it ends in a very difficult, confusing, high note. But then obviously, we only know the theme, when you think of "Swan Lake," you think of the theme that's "da, da da da da da."

ND Mm.

CJ So then that will be like the main concept, which is then extracted into smaller versions. But we only need this one page, which has the main instrument that plays the theme, and that will be obviously what we listen to, when we animate. So I'm suggesting that you have to have a basic sense of terminology, just terms such as "andante," which is a tempo that it should be played at. The dynamics, which is like there, you know, it's soft, and maybe it should build up to there, because there it's louder, and which is "forte." And then ja, maybe the terminology of mood, which this is, says, it says it should be "swiftly but expressive." So that it also gives a indication, to the animators as to how to portray the movements. So I drew up this bar sheet specifically for this animating, ja, for this piece. And then, so what will happen is, you will write down the title, you will work out the tempo and frames per beat. I know some music sheets even have the tempo on the thing. Otherwise, you can just listen to the music with the, the click track and everything, and you can just indicate it, by working out how many beats are there in 6 seconds, and then multiplying it by 10 to get the tempo. And then, ja, you can work out the frames that will go into each beat, and then the beats per bar, obviously.

ND Mm, mm, mm.

CJ So then, with this, you will get the full music track obviously, and then the click track, which indicates the beats, and this.

ND Ja, that's it.

CJ So then, you are …, the animator can put in the screen shots, or the actions that they propose, that should happen here. And they can write down the actions, maybe elaborating on what, you know, what happens where, and such. And the reason why I say that everything should be at, like this, is because you have everything together in one place. I know as animators, we …, like I have a big tin of notes, where everything …, maybe I should just work out this on here, or I should just write down here, maybe I should do this. And here you have everything together, and it's basically the whole dance scene in one page. And I'm very well aware that we're living in a digital age, so this will be obviously, maybe digitised, so that it can be updated by the musicians as well as like the animators working on it, or from it, so changes can be made. And then maybe it can even be shown alongside the reference video, which is also something we use a lot. And then, ja, this will, I hope, help animators animate more proficient …, well, effectively, and even more believably by the help of like musical competencies. So, yes.

ND Ja, I think it's cool.

CJ How do you feel about the idea?

ND I think it's really cool, like, I mean, it makes so much sense. I think it might not work for every type of production, like you know, it's small and tight, and people just don't pay attention to these things unfortunately, but like, for instance, in this film on which we are working now, which I think it's the same as the process from Stickman, it's like the make music sort of after the animation, you know what I mean?

CJ Ja.

ND And which I think is silly, because you know, like say the music is like half the film, so now, and like you say, the musicians and the animators don't work together at all, like zero. But you know, I mean it would be cool to have this, because like you say, because you'd see where the shift in energy happens in the music.

CJ Mm, exactly.

ND And you can design your animation according to the shift of energy in the music, instead of like you having your own, your own flow of energy, and the music having its own flow of energy. And usually the case is that the musicians have to run afterwards, go back, and try and change things to work, which seems like extra work ja, it's weird.

CJ So much extra work.

ND And I think also, it might be, I don't know, I think, when they get like ten musicians to, you know, and compose this, to compose the music before, like …, and I feel like there would be …, because music, we know it goes across shots. There are no cuts in the music, like it's one continuous …, you know. It covers the whole moment, and describes the whole mood and tells the whole like sequence or the whole scene, or whatever. I feel like it would make so much sense to first have that, and then start animating, because that sort of helps bring everything together. You know, when you're working with shots, everyone's working on different shots, and it's like, it can be, it's always quite difficult for everyone to come with like, you know, or put together, whereas if you had the music in the background, which Lee does, I think, who does our, like when you're working together, and everyone's in search …, it sort of helps bring people onto the same page.

CJ Mm, ja, it's that golden thread that keeps everything together.

ND Ja, ja, ja. So I do think it's a great idea, like I don't know why they would have got rid of it in the first place.

CJ Ja.

ND I mean, I do Pixar, and you know, Disney studios do it right now. Like I didn't do it right now. Do they, because this makes sense.

CJ Ja, no, I agree, this does make sense. Why would they leave this?

ND Ja. I would imagine that they would still, you know, do something like this – do you know?

CJ No, I've done a lot of research on it, but the thing is, they don't write a lot about their specific production processes, you know about the production line and you know, pre-production, and stuff like that, but not about …

ND You're free to ask someone, or maybe you're not.

CJ To get hold of them is also a mission,.

ND There's actually a guy at the studio, at Triggerfish Studio right now, he, he's a writer, and he worked on like, he worked at Pixar a couple of times I think.

I think the idea should be pushed further… The animators and creatives might have to push for it though because the directors might not want to implement it because of the extra costs involved.

[END OF RECORDING]

INTERVIEW 3:

Interview with **Daniel Snaddon (DS),** animator at Triggerfish Animation Studio, who acted as Lead Animator in the animation feature film *Khumba*.

Date: 30 August 2016

Length: 55:41 Minutes

Place: Triggerfish Animation Studio, Cape Town

CJ Okay, so I'm going to ask you a few questions. What were your responsibilities on the film Khumba?

DS So my responsibilities were very much like Matt's, I was animation lead. So I had a team, or I had two teams of three animators, and each team would tackle sequences in the film, and my job was kind of sort of to keep them basically going. So if they had any technical questions or any creative questions, I could help them with those, I was also there to kind of keep them on style and up to standard in terms of the quality of the animation. And then I was also there to kind of help production and sort of keep people on their schedules, make them aware of their schedules.

CJ What particular characters did your team and you work on?

DS I think we worked on pretty much all the characters, so even though there were six of us in the team, or seven including myself, there were only twenty... say twenty one animators including the crowd team in Khumba, so we did a third of the animation movie, so which means we did almost every character.

CJ Basically everyone?

DS Basically everyone. I think there may have been a couple of the endangered animals that we didn't work on, I don't know if any of my guys worked on the penguin, but we definitely worked on the meercats and we may have worked on the springboks near the end, but we didn't do the great big springbok scene, that was actually Jaco's teams.

CJ Ja.

DS But we did a lot of Khumba's stuff. Like our team did a lot of Phango and Khumba stuff, like we did the big fight scene in the cave. Like we did Khumba's birth and all sorts of emotional stuff. We didn't do a lot of the funny stuff, we did a lot of the emotional stuff.

CJ Did you choose to animate those particular scenes or were they assigned to you?

DS They were assigned to us. We could put in a request and they'd try to accommodate us, but they were assigned to us.

CJ Okay. Did you animate any dancing in Khumba?

DS Not personally, no.

CJ And your team?

DS I'm trying to think, I don't think so, I think they were all handled by Matt's team. Because Sam was in the team and they wanted to give that to her.

CJ (laughter) And have you ever animated a dance scene on your own, in your personal background?

DS I'm trying to think now, (laughter) yes I have, it was for a Coco-Pops advert. And it was one of those things where you kind of feel, like it's the last Coco-Pops advert I worked on, and the agency brought in a video clip of a Macarena, it was (laughter) "guys, like guess what, we're going to make like a Coco-Pops dance and all the kids are going to go and do the Coco-Pops dance at school". And I think we're like also thinking maybe they will, but probably not (laughter)

CJ Shame.

DS That was their reference, and they had like a very specific idea about, like they basically made up these lyrics, and we had to make up like dance moves to go with the lyrics. It was extremely lame. (laughter)

CJ Haha

DS Let's just – I'm just putting out there, it was extremely lame, it's not the most... my proudest work (laughter) I just feel like, it's the kind of advert that would have made me very angry as a young child. It's like, "that is so patronising. How can they sell this to us?" But maybe, I'm not the target market, I don't know. But ja.

CJ Ja I don't know. So that was the only dance scene that you can think of?

DS That is the only one that – oh there's another one. I did a little dance scene for I think Mind's Eye, I don't know if you know Mind's Eye, they're like a TV show?

CJ Huh-uh.

DS But we did a sequence, well I did – I kind of did the storyboards for a long explaining video for the public, for the department of basic education. And it's a long explaining video where there's like a sequence where the teenagers, where they decide to stop working and they start partying, so I did some dance scenes there.

CJ Cool. Please explain the process which was followed to develop and incorporate music into Khumba.

DS Well in Khumba we had Scratch Tracks, and we knew they were going to be replaced, so we weren't so sticking too closely most of the time to what the music kind of gives you. But I mean that's not the ideal way to work I have to say, I mean we've got the same situation now in Revolting Rams where the music isn't done yet, so we're sort of having to work with the scratch and hope that the musicians and the directors also, you know...

CJ Fit it in?

DS Well we'll do the rest. But I think animation works a lot like that unless you're doing a big musical production with a big budget, you'll very rarely get, or you're doing a music video, you'll very rarely get to work with the sound, it's going to end up being, well, you know...

CJ Ja.

DS So I can tell you like about the processes there is and the processes there should be? (laughter)

CJ Yes please.

DS The processes there should be is that like every time you are thinking about animating anything, you need to be thinking about the story. What is the moral of the story? And I think the thing is, like it's been interesting working with Sam and maybe she'll talk about this with you, but the dance sequences we're doing right now in Revolting, it's a sort of escalation in in this relationship between Cinderella and Prince Charming, and because it's Roald Dahl, and everyone who's read the books knows, he's actually a bit of a villain, and so you sort of have this bit of a thing where she's like this innocent girl, and then she sort of becomes corrupted through this – you know, this dancing with this sleazy guy. And at some point she takes over, you know, and she kind of lets her hair down so to speak. And you've got to kind of find ways to work with the music, to hit the story beats, to sort of show the change in attitude and through the dance thing, show that this relationship is progressing. Which is a lot of fun. And I think you know that that's the way it should be, it's a story with dance, and if you watched some of the great musicals, like some of it's spectacle, but a lot of it is about trying to say something else about the character, and it's abstract, you know, it's caricatured, you kind of think about West Side Story, and like the Jets and the Sharks, and like how the Jets dance and how the Sharks dance, and they're trying to get some things into the choreography about their attitude, and the one's more Latin and more of a flourish (laughter) and the others are more like, they're more kind of street, you know, thugs. (laughter)

CJ Ja, but don't you think that to portray that style specifically, you need the music?

DS You absolutely should, you really should, so we're working with like a scratch track that the guys really like, and apparently the composer's trying hard to get it...

CJ Is it, ja.

DS So it will hopefully have a lot of the same musical cues. But what they've kind of done, they've kind of got a lot of very specific cues in their music, so there're kind of breaks, you know, when like you hold this, and you hold the pose, or you go back into it and just like little flourishes or little... you know, that gives you ideas. We're just hoping that all that is mixed into it, sure, because that's what Sam's been concentrating on.

CJ Oh, great.

DS Yeah, in Khumba I think the only dance sequences are Bradley's dance, and the dassie's dance, I mean those are the two ones that spring to mind.

CJ Ja, Bradley has the one where he sings ostracised and then...

DS Ja, I'm sure Sam will tell you that that was cut drastically.

CJ I heard Matthew said something like that.

DS Maybe Sam's got the whole thing for you, maybe she can show you what it was supposed to be like, ja.

CJ That would be nice. Was there sound incorporated into the animatics that you worked on for Khumba?

DS Very little hey, very little. I mean there was, but it was on a kind of need basis you know. So you had the dialogue, and then any kind of big punctuation thing, you'd have it there, but a lot of the time it was kind of missing, and they would say "oh do it later". And I think that it's not a bad... I mean it's in animation you can actually work around that kind of thing. And I think you know if you have ideas about retiming things, like oh you know I think that hit should come earlier, it would be more of a surprise, for example. Or I think that I need a longer pause here, because I don't think that anyone's going to read what the character's expression is, so how can they know what they're thinking? If you have sound in there it can be more difficult to sell that idea, or it just takes a process between you and the editor. But for the most part the difficult thing about not working with sound is that it's difficult to tell what you have. It's like... it looks fine, but is it fine, you don't know.

CJ Ja, you can't see the bigger picture.

DS You can't, and you can't feel the continuity and you can't feel the drama, you er... it looks like something's happening, you know?

CJ Ja, ja.

DS It's like... watching a movie with your ears... with the sound off, you know, it's just like not scary or it's just pictures, you know. So it's more difficult to sell ideas. (laughter) It's like, this is definitely working, they're definitely sad, but it's like, I don't feel sad. But it's only 2 seconds long, you know? (Laughter)

CJ Ja. Do you think they worked from the animatic when animating the dance scenes?

DS Er... no. I think that they pretty much – it was, the animation on Khumba only had like a couple of iterations and wasn't something that they had a lot of time to polish. So I don't think any of the posing ideas or anything like that came from the animatic.

And actually on Khumba what ended up happening more often than not is that we'd have to re-board something, it was a mess by the time it got down to us. So that's not, I would not recommend that, make sure that you guys have your boards locked down.

Just... just feel like you've got something strong to start with. Do you know what it is? It's a learning process, you know, so you know it's difficult to come up with when you start to animate something that's going to animate something that's really clear for your story. Because you're thinking about your shots, you're not thinking about the whole picture here, you're not thinking about the whole thing. So when you do your storyboards, you've got really good information in there, then you've got a good foundation to start with. And what you're going to try to do is, from storyboards animatic to animation, you're going to try and make sure there's more information at each stage. So here in the drawn animatic there's information about the posing and the timing. But then the layout, there should be that plus camera and you know, whatever else you're going to need.

CJ Oh, ja.

DS Then in the animation it should be everything that was in there should be in there but better, you know? It shouldn't be like that sucks, you know, I have to rethink it. What could we do, you know?

CJ Ja, come up with new ideas.

DS Because it takes a lot of time, yeah.

CJ Ja because I think it could have saved time to have everything properly planned out.

DS And also, every decision you make then is relevant to all the other shots. And if they haven't thought about that, about how it's going to be when the animation is planned, it's like you get to that then, okay why don't we make a great big thing here, and he can be like looking, like he's one, and it's like that becomes four shots later, so it's like oh damn, what are we going to do? (Laugher)

CJ Ja, shame.

DS You know, so there's something that's really important, to have a good blueprint. And that's something we did on our last movie, Stickman, we had an animatic that was extremely solid. And if you look at the drawn animatic and you look at the finished animation, most of the vital animation is in the drawing, you know. So it means that at each... it wasn't a smooth process, I wouldn't say that because we struggled to kind of hit the quality and the style, but what was good was that each of those different layers, gave you the right information to do your next job. And you could always point back to this, it's like well this is the story. That's not clear, you haven't got, you know, what we've got in there.

CJ Ja, ja, it's not communicated.

DS It's not communicated, yeah.

CJ What did you think the the animators who animated the dancing, received to animate the dancing? Obviously they received the the animation, and the animatic.

DS With Bradley, Sam would have got the version of the song, and I don't know if it was the final version, she'll have to tell you. But it was I think it was, it might have been a scratch version of the song that was composed by Bruce and performed by Richard E Grant, and then she would have been kind of briefed on, you know...

CJ What needs to happen.

DS What needs to happen, and then she would have collected reference videos and started from what happened there, or she would have shot some reference videos.

CJ How would she have gone about to use these tools to animate, to go about the process of animating then?

DS You know, I think dance sequences are not that different to how you would do any piece of animation. And I think that what's interesting for me, having worked a little bit with Sam, was that like, to choreograph something, is a lot like planning a piece of animation. So it's sort of beat by beat you know, and it's a time based medium, so in dance it's to the music, music, and it's a time signature, you know, and it's sort of to a piece of time, and it's exactly the same. So in fact thinking about dancing as an

animator, they're very closely related. And you'll see, if you go to watch good dancing, is like they also sort of pick up on some similar ideas around what looks good, and especially sort of telling, if you go to see a musical, they will, you know, they'll hold poses and they will exaggerate arcs and they'll do big anticipations, so that you can see what they're going to do next. I mean it's very closely related, so it's not something that is difficult to translate. And I think the thing that Sam has that most of us don't have is that she has the vocabulary of a dancer, and she has this whole sort of a library that exists in her head. And she'll know what looks convincing, you know. I think with us it's tempting to do something that's cartoony and whack and out there, with her she'll know where the weight's supposed to where the weight is supposed to be and what you have to be able to do to prep a move, you know, she'll make sure all that kind of detail is in there, as someone who can do it, and that's sort of quite rich. And then you've got, as an animator you can sort of go push that, those ideas. I think in Khumba, it's interesting watching it again, having been through these last two projects, because our styles in animation have changed so much. Revolting Rams is – it's almost like, it's big, it feels like some of the shots, could be out of a (Indistinct) you know, it's huge, it's like super exaggerated, some of it's more subtle, Stickman is very subtle, it's like a very short stop motion film for very young children, you know. Khumba, funny enough started off, the brief was at the beginning, can we make it feel like stop motion. When we started working with the characters we found that that was not going to be right for the story, because the story was more dramatic than a comedy, it was a drama.

CJ Ja it was.

DS And it was these big vistas, and these quite naturalistic characters with real hair and like that, so as soon as we started doing all these little stop motion tricks, it just felt weird, it felt like not finished. Everything else was finished but the animation, you know, so we abandoned that idea and we went for something that's very natural. So the dancing is very natural. The dancing that we're doing we're doing now in Revolting, it's very pushed, you know, so it's got the basis of the dance and it's got the – these little cartoon lines where we hold things for longer than is physically possible, and the characters of course, it's like Despicable, so we make, we turn them into real, you know, we turn them into real slime balls. (laughter) At points, ja.

CJ Where it's needed (laughter).

DS Where it's needed ja, which is fun. (laughter)

CJ Ja. Do you think she would have received the sheet music or just the track, like the audio track?

DS No, just the track. And I don't know too many circumstances under which that would be useful or necessary to the animator. Also because to the animator, like stuff isn't usually till at the end. But also because I think, I think in terms of the kind of things we're looking for, is we're looking for not a technical like what do you call it, specificity? We're looking for what looks good for what we're hearing, so if we had to sit down and look at like the bars for example, you know, it's information that we don't really need because we can hear it already. Having said that, Sam will break it down, and say like that this is – here's a bar, here's a... you know, and it cuts half of

it, we don't get to the end of this thing, so we need to... but she plans that in her choreography, and she gets that from just listening to the track, she doesn't get it in a...

DS In a brief, yeah (visual manner) she doesn't get it in a pack, you know.

CJ So the musical timing, is it worked out by just listening to the music, and like as you say, she's planning it out, it's not uhm... ja and working it out, that's basically what I'm asking.

DS Yeah, yeah.

CJ What did you think was animating about, or is challenging about animating a dance theme?

DS I think that it will be the same that makes, just thinking about my other, experiences, it's the same things that makes animating anything challenging, are you telling the story and are the characters coming across in the ideas that you're putting forward in the dance? So in a dance you have like the opportunity to do something larger than life in quite fun ... and a good piece of dancing can kind of create a very emotional experience. I don't know if you've seen seen that clip, Thought of You, by Ryan Woodwurn, have you seen that? Oh I must show you this thing.

CJ I don't think so.

DS This thing, it's like an animated dance to the theme, and then it's this guy and this girl, and it's the story of their relationship, and then they like – he uses the two in animation to kind of show like the ideas that come through in the dance, and at one point she does this, and then he like draws wings to show like .. you know.

CJ Ja, it sounds beautiful.

DS You should, for your stuff, you should see it and you should try to get hold of that guy, because I think he would have so much to show you and to tell you about what animation and dance can do together, you know?

CJ Ja, ja.

DS And we haven't had like much of a chance to do that.

CJ Ja that's true.

DS But I think like maybe that's a good point, like what can animation bring to dance? Because dance is already a form of expression, you know, like it has it's own thing you know, so what can animation add to that? We talked about like there are similar principles going on, how can we describe them in animation terms? So animation can push those ideas. And maybe it's about sort of a layer, putting a layer of information onto the story.

CJ Oh, ja.

DS Oh you know it might be good for you to chat to Michael and Joe as well, because they've also been working on a dance, like a ballet, doing visuals, doing like ...(Indistinct) style visuals for this ballet called Firebird, and it's just played in the USA,

it's been on tour there, and it's like some of the guys from Handspring, used to be Handspring Public Company, and they made this giant, giant creature on stage and stuff, so that's another, that's different to animation, they're not only animating to dancing, they're animating to work with dancers and to work with music, so that's another... But I think it's about adding layers and meaning. You know, layers of interpretation. As an animator you have your tools, by saying that's something, what can I bring to it, you know, how do I make it more… or change it.

CJ Do you think it's more difficult to animate quadrupeds versus humans, or humanoid characters?

DS Humans are difficult because we expect a lot from them, we know what they look like, we are those guys. So especially if you're trying to make very emotional human characters, like the more natural they look, especially, the more creepy they feel because of the uncanny value and all that kind of stuff. Quadrupled were surprisingly, were easier than I thought, I hadn't done a lot of quadruped stuff, but basically if you think of like the zebra in Khumba, you've basically got a guy without any arms, standing in front of you talking, and then he's got these hind legs that sit behind him.

CJ Ja (laughter)

DS You know, just so they'll do whatever the rest of him wants to do, but in terms of like your acting and all that kind of stuff, that usually happens... and Khumba is quite a talky kind of movie, so there's a lot of like these guys just like talking. And when we show reference, we were just like talking.

CJ Ja, not... (laughter)

DS So we were trying to get everything in like, the head and the back, you know. So I think like the difficult thing is trying to find enough interesting business for them, you know. And I think something we didn't do enough of in Khumba which wasn't called for, but I mean if you look at a show like Bambi, most of them are like, you know, I think it's got a bit of a like... but if you look at a movie like Bambi, there are these moments in Bambi that are quite quiet, and they're really just like observe moments, about how animals are. We don't really have a lot of that in Khumba, we had this dramatic sort of African folk tale that we wanted to tell, and we just kind of got down to it, but there's kind of like a lot of beautiful like observed things, like in with quadrupeds, depending, and I mean there's also this question, like how human are they, how much like the animal they're portraying are they, and then how much like... or is it just an actor without any arms?

CJ Ja, so...

DS So you want to try to ... every movie is different, they treat it differently, and you get more natural and you get more abstract. You kind of find your place on the scale.

CJ Ja, ja, make sure you know where you fit in. (laughter) Do you know of any specific methods that animators might use to animate to music?

DS I would say people looking to animate to music should do some research depending on what they're supposed to be in their animation. Then you do like a lot of research. So if you've got a dance to do, you can't just say it's a dance. There's as many different

types of dances as there are people. I mean like each one has its own specific character. Like a tango is not a waltz, it's not a – you know, it's not a foxtrot, you know, and you've got to figure out what's right for the music. What you want to express, and what the... you know, and I think it's very useful if you're doing dancing to get a little bit familiar with that language. My wife and I do Lindy Hop and Charleston and stuff, just for fun. And it's been amazing, it's been an amazing process for me, kind of learning, you know, how it all works. That you have a basic step that you always go back to, and that things, and variations you know, like things, like these different kinds of moves that you learn, but then you combine them. And she's, you know, she used to do karate, so for her it's also like something kind of similar, you know, you kind of have these things that you learn but then it's about how you combine them, and how they work together like you know, to make something. So yeah.

CJ Ja I know, that does make sense.

DS Yeah, I would also say that people animating to music, if they're ... if they're showing a character playing the music, like if they're performing the music, they really need to know how that musical instrument works. Like they don't need to be able to play it like a maestro, but they should be able to identify what is going on.

CJ Ja definitely.

DS You know, and to be able to convey that with sincerity, you know.

CJ Ja definitely, it's very obvious if someone's for instance playing a piano and you can see that's not how you play a piano.

DS Exactly, you know, yeah.

CJ Do you personally have any musical skills?

DS I play guitar, and a bit of piano, I can't read sheet music, but yes...

CJ So it's self taught?

DS Self taught yeah. I did take piano lessons for a long time, it's a bit embarrassing, but yes.

CJ But then you can read sheet music?

DS Kind of, but not really, it's like I can work it out, but like very slowly, you know, but very slowly. If I look at it I can find C.

CJ Find C, yes. (Laughter) Okay, and so do you think you have an innate musical talent or an exceptional love for music?

DS I would say I have a love for music, yes. So I don't know if I can place that above or below the Average Joe, but I do love music and I think it's important. And I think it's as an animator I think it's something that's very enriching, you know, so I think it's a good thing to know about and to kind of dive into.

CJ Ja it is.

DS I mean it's something that's very humbling for me, so I got to go to the music to Stickman, and it's a sound recording, in London, and the studio that we recorded the music with, it's called Air Studios, it's an old church, and it's a studio that used to belong to George Mahn who produced the Beatles.

CJ Wow!

DS Yeah and these guys like they do, Abbey Road is them, and there's maybe one or two other places, but they do almost all the TV and film scoring there. So like our engineer came up to us before we started, his name was Jay, and he says, I'm really in the good books with my son, his kid, he's like 4 years old. Why is that? No he says well last week I was recording the music for the Star Wars trailer, and like this week I'm doing Stickman, so I mean I'm like, a hero to my son right now, so that was very... and they had about thirty something musicians come in and ... on the day, only one day to record 25 minutes of music, they sit down, they've never seen the music before in their lives, they like get the pack, they open it up and say is this what we're doing, Chris will take it from page 1 and I will take it from page 25 and we'll just do a couple of like dry runs, and they sit down and they start playing this thing, and it's like they've played it for years, like they've always known it, you know?

CJ Yes.

DS With a couple of little fudges here and there, but it's unbelievable, like thirty people just sit down and just play. And we've been working on the thing for like a year and a half (Laughter) it's very humbling to kind of, to have that experience. You know, and the music is superb, the movie, I don't know if you've seen it yet?

CJ What, Stickman? Yes, it's great.

DS The music is really, really good, and it's half the experience. You know, I think the music is half the film. You have great actors giving great performances, you have great animation with really original ideas, but the thing there, if people are going to feel kind of like weepy, it's probably going to be because of that, but it's mostly because of the music.

CJ No, that's true.

DS It's like how it's sort of ... you know... Oh something that you might find interesting as well, we find that music kills comedy. That's one thing that it doesn't do well, it's like there were some parts that we always got laughs in the acting and in the animation, and they weren't being funny any more, and we ended up in stripping the music out and just having that.

CJ Ja just silence.

DS Just silence with sound effect, and it got it back. And it's interesting, because music basically creates the tone of the thing, and it creates expectation, so you know if it's sad or if it's energetic, you just feel like you know, like there's a link between these things, he's running around with the pipe and the dog and it's like tic tic tic tic and if you have that, and something's happening, you kind of like just keep, and it's just going to keep going, and you just feel like it's just going to keep going, because that's what the music is suggesting, it just feels like it's just going to keep on going, tic, tic,

tic, tic, so it's not a problem. But if you cut the music and there's just like silence, then the audience doesn't know what to expect, and that's where you need in comedy. You know, you can't tell them what to expect, they have to be like oh, what, what's going on, and that's what creates. Yeah.

CJ Ja that's very interesting. Do you understand basic musical concepts and how they relate to animation?

DS Er... more or less, but I have a suspicion that if you were to grill me on my musical theory... but I mean I'm like, you know, we often talk about, something in animation we – more like staccato, you know, which mean more like you know, chop it up a bit. And make it feel like those things, yeah but also feel like little points, and we'll talk about like… I'm trying to think of like some other good examples, but I would say that we don't use the same terminology, I don't use the same musical terminology often. Something we do do though, we'll make sounds to describe motion, so we'll say like if someone's like done something where the character is sort of going from one post to another, and I'll often say something like, you know what it feels like, it feels like he's going Mmmmm.... (laughter) And water is like (dripping sound) and you know so that kind of stuff is like useful to describe what you want (laughter)

CJ Okay so do you think it's intentional that you like say for instance staccato, because that's a very musical term.

DS Uhm... it's like, you're always looking for ways to get on the same page as your team. So whatever is useful, you know, there are kind of very musical animators on this team, I think more than half of them play a musical instrument and then two or three of them actually perform, like quite regularly you know. And sort of talk to them in those terms is like useful, you know, so they're like oh I know what you're talking about, like staccato, yeah, staccato you know. But we don't go like make it piano, or I need like whatever, you tend to use whatever you have, whatever is in your vocabulary, so that you're on the same page.

CJ Ja, it's very interesting that so many animators have musical backgrounds or play like musical instruments and such.

DS If you think about it though, and I say that they're similar in terms of as a medium they're similar because they're time based and performance based. But they're also similar in that they're technical. Like you can't just pick up a violin and start playing, you have to learn how to play the violin. It's the same with animation, you have to learn how to draw, how to use the mire you know. And there's this technical barrier between you and getting what you want, and people to get through that instrument, or get the discipline to get through that, and get a kick out if you know, sothere's definitely coloration there.

CJ It's actually beautiful. So I just want to tell you about a few terms that you've mentioned, but that's actually relevant in animation and the same in music. That's just for you, I will describe everything for you now.

DS Yeah, yeah.

CJ But the first is timing, obviously musical timing is very much like performance timing, and then there's tempo which is the same as pacing in animation, which is worked

out in beats per minute, and in animation as well, and then rhythm which relates to time. And then I've just put in like a way of working out the rhythm, which is frames per beat, which is obviously the 24 seconds per frame which we use in South Africa. And then by... which gives you that, and then you need the beats per minute which is the tempo, and then you just divide the frames per minute by the beats per minute which is then the beats per rhythm.

DS Yeah yeah. So that's like a marching beat, twelve frames is like doom, doom, doom.

CJ Ja, so that's just actually like a few things which is relevant, that's actually like the same thing in music and in animation. So did you think that you used your musical knowledge or use your musical knowledge to animate characters more believably?

DS I would say it's more about your sense of entertainment, funnily enough, than about your ability to do something – when you say believably, I think something that's more about mechanics, to do something that's convincing. That you know, that that zebra is actually standing there and he's breathing, you know. I would say that what musical – if you're musical is that what really helps is that sense of.. what's the word, like what works in a song, like lots of songs have different ways to do this, but they're trying to wring emotion out of you, you know, so what is it that attracts you to something and feels good and like certain things have like climaxes you know, and certain things they'll use contrast to make something feel more exciting, or more energetic. And I think all of that kind of helps you to have a sense of what's entertaining in a piece of animation. Because I think the thing we're always fighting is something that just feels predictable and feels like it's plodding along, you know, feels boring, like even a – it's sort of er... it doesn't have any texture, it just feels like that guy is going over there and he's doing something, and then he's doing something else, you know, you're always like trying to look for ways to kind of make it feel like it's got character. Something I've always thought of is how different orchestrations of the same piece of music can change like the feeling of the music, like enormously. Or like you just hear people covering different kinds of songs, and you just hear what they do with the songs, the same structure, but it's that person who's playing it to you, it's their kind of structure, and it think it's the same for animation. I think that being aware of that stuff in a musical sense is what makes you more aware as an animator. There's no right way to do it, it's about how you connect with the audience, you know.

CJ Ja, ja.

DS What are you putting in there, you know, and I think the big difference is that music you've got this wonderful, abstract, you know, thing where you put things in a certain sequence, you know, put notes in a certain sequence and you're going to get some kind of response, so you can play a piece of really good music kind of a bit shabbily or a little bit ordinary and people will still connect to it. Because the music itself has a thing in it whereas in animation there's a meter, it's about how good are you at seeing what's inside somebody and brining that out and showing it, you know?

CJ Ja.

DS How good are you at observing people, and noticing all the little beautiful things about them, in order to create something that's exciting that people will watch, you know? Yeah, so (laughter)

CJ Mmm. What other skills or such do you think is necessary to or will help maybe to animate to music?

DS If you don't feel that you're musical and you feel that you don't have a good sense of that stuff, then I think the only real option for you is to study and to get the knowledge. So if it's not a feeling that you have that's from a background of musicality, you can go and you can break down a dance to like a thing like, you know, and then apply layers of information to it. It's much drier and it takes a lot more time to, you know...but I think observation's the big one and you have to then, and you just have to talk to people and get a sense of how they feel about your stuff, because if you can't feel it that's a problem. If you're not feeling it, you know what I mean?

CJ Ja.

DS Like then you need to really just show people things often and like just analyse things, you know?

CJ Ja, definitely.

DS Those are your choices,

CJ My choices (Laughter)

CJ Have you ever used the bar keys to animate to music?

DS No but we do use things call x sheets, have you heard about those?

CJ Ja.

DS Okay so it's very similar. A similar idea, and it's just much more geared towards you know?

CJ Vocals.

DS Well it's not just about vocals, you can put musical hits and that kind of stuff in action as well, but actually it's just a way of breaking down your audio track, 12, 24, frames per second. So I have done that, I used to use a piece of Thule software that you couldn't put – you couldn't load the sound, so if you wanted to do a lip synch with it, you couldn't ... you had to do it actually on...

CJ Oh ja, ja. Okay, do you know how music was animated in earlier days?

DS Mmm... I do have a sense, a little bit of a sense of it, I believe that they, especially on the old shorts, like say symphonies and Loony Toons, like that kind of stuff, actually the music was recorded before, and – and was recorded with the animatic, and they used to – they used to do them at the studios, and the studios all had big orchestras, and you could get time with the orchestras, so I mean if you go back to one of those old, like Warner Bros Bugs Bunny cartoons, like that kind of stuff, it's amazing, like the orchestration is amazing, and it's like everything is told through the music, like everything. And in fact they don't have that many sound effects.

CJ No.

DS They have like these very specific sound effects for specific moments. They don't have like all these layers of atmosphere like we do now, you know, so I believe they used

to record, they used to do the storyboards and they used to orchestrate to the storyboards, and I mean like – incredible stuff. I mean like if you think about it, like there's these sequences like where Sylvester and Tweety, and he's trying to give her crap, and he just keeps going in and out of her room, and he's like doing more and more stuff, and it's like the orchestra's going, doom, doom, doom, doom, doom, (to a tune) and they thought about all of that beforehand, and the animator would do that, and they would get the act sheet based on what the orchestra gave them. You know?

CJ Ja, no definitely.

DS So there was more opportunity I think that came to play a role in telling a story upfront, you know, and it's a different way of doing things, a much more expensive way of doing things, yeah.

CJ I'm just going to explain to you a bit about Disney and stuff before we go on. So okay obviously you know that for Silly Symphonies and such the music was only done afterwards?

DS That's right. Yeah.

CJ And then it wasn't that successful in terms of portraying feelings because the music was only an afterthought. Then came the first synchronised sound, with Steamboat Willy.

DS Yes.

CJ And that wasn't a huge success, and the – like you've just explained, the music was done before, with the animation. And then there was a stage where the animators at Disney said listen, there has to be an easier way to do this, we're going back and forth the whole time and it's ja, there has to be an easier way. And then this one guy, specifically Wilfred Jackson, he had a basic musical knowledge, and he said but listen, we have timing in common with the musicians. So what if we use the metronome and bar sheets, by the use of bar sheets, and then we can all work together in one central place, and we can work together in the music room as they called it, and they had one central place where the musicians and the animators worked, and if changes were made they were all aware of it where...

DS And it was all on paper.

CJ Ja, it was all on paper, where ja... and then they can change it and work from there.

DS That's amazing hey? Very cool.

CJ Ja, it's very cool. So this is the bar sheets, also where ex sheet layouts that the vocals and it indicates the certain beats and stuff along with a certain amount of bars. And then it was also done in earlier days on sheet music itself, where the musicians would have still been writing, like you can see his handwriting, and then the animators would write here, yes here he reaches up and says this, and this happens here. So the actions were written along with the music in a certain amount of bars.

DS Yeah, yeah.

CJ So it's changed then to get to more detail, with the musician still writing up the music, and then the animators and actions, having camera angles and... er... but still and er...

this is very important obviously for timing, to work out the precise timing which they will work from. Then in nowadays the people still using bar sheets, seeing it's moved away from the music itself, and it will incorporate like storyboard frames or just screen shots for instance, with then writing down the actions and then working from this timing to animated things, but at the moment we don't have any musical cues any more. This is more later bar sheet that they use. And I suggested that this is quite problematic (laughter)

DJ Oh yeah?

CS In terms of the animators don't get the feel for the music and what to animate to, but get – I'll get to that. So I propose that animators have a basic sense of musical knowledge, and by that I mean it's something you probably have, but you don't really know about. I'm going to demonstrate this by the use of Bradley's ballet scene in Swanlake. So this is the orchestration to the orchestra, written by Tchaikovsky, and as you can see this is a lot of bars to read, and most animators won't even know what it is, I don't believe.

DS No, good grief.

CJ And this is twelve pages, and it's like this (laughter) I'm not implying that they should know how to read those and to like deconstruct everything, but obviously as everything, music has a central theme, Swanlake's is that (singing). Yes and that can be broken down into smaller parts, such as this, but essentially then what we only need is the main theme, which I just sang. And that's from twelve pages to one page, I suggested that they only have this one page.

DS Right, right.

CJ So with this animators will then receive obviously only the – ja the sheet music, and a click track, which will only indicate certain beats and then the – obviously the music itself, audio track. And then they will receive one of these. With these I suggest that the basic musical skills – sorry, forgot to say that, I suggest that they should have is just to know basic terminology, like this indicates the type of tempo that should be played out, that whole shakes, so this tells you about the mood, swiftly but expressive. This could also be a very good indicator for the animators on how to animate this particular scene.

DS Absolutely.

CJ Then obviously the dynamics, here you can see it starts very softly, piano, but it goes to the forte, and that will be then the high points of the animation as well, if you want to convey it like that. You will be able to hear this audibly as well I know, but I think to see it visually as well, I think will help a lot. Then I don't suggest you know where Middle C is like you said, (laughter) just basically know that this is higher than that notes, and like the music goes up and to... maybe you will be able to hear that as well, and just timing, basic timing. Know that there's four, supposed to be four bars in four beats to each bar and then work accordingly to that. So then my proposed bar sheet will look something like that, like this, it will then have the title Bradley's Ballet, and the tempo which will be given to you, or you can work it out, and then the frames per beat which will be, ja, worked out according to that, which will help the animator then

to know how many frames they will have to portray a certain action. I suggest that the animators use one of these, because like you said, Samantha, like any animator actually, we plan out our scenes, like what we work on.

DS Yes.

CJ The thing is, we do it on all different types of papers, and there's a page there with the right amount of timing, and there we write something else, and here you can basically see a whole scene on one page, and you can plan accordingly, and to write down like the action scenes, to see what's happening with the visual music is, I don't know, just a compact and better way, well maybe more efficient way, I can say like that, to maybe animate. So I know we are living in a digital age, so and paper-wise, say like type of recycling eco friendly age, so this maybe even digitised and then from there, maybe once the music is updated, the musicians can update what they have and you can work accordingly. It can maybe even be shown at the bottom of reference footage which is as you said we work a lot from.

DS Yes of course.

CJ And then from there the animators can use this as a guide to animate their particular scenes. So that's what I'm proposing.

DS That's great. I think that having a good sort of foundation knowledge of basic like music terminology like I think is a really good idea. And then with regards to the what do you call it, the bar sheet?

CJ The bar sheet.

DS I think it's a really nice sort of tool to be able to plan those kinds of things out. And I think what you'll find from the animators is that some of them might be very excited about the idea, look I'll be very keen to hear what Sam has to say, and then Sam will find this stuff quite intimidating.

CJ Ja, ja.

DS So if it can be something that almost is like a layer of information on a timeline, you know, that would be, that would probably be like a nice way to do it. The other thing that I would say is that it would be probably be quite useful when doing something that's very heavily reliant on the composer and the music, and we can get that before they have to animate. So I mean things like, if I could, like Fantasia and maybe the big musical sequences in some of the Disney films, that would be pretty cool, hey? That would be very cool. I'd be keen to see what they're doing now for these modern musicals, I mean like Tangled and Frozen, and to see what the conversation has become over there. Because we don't really know.

CJ Not at all.

DS They haven't really released anything yet.

CJ And there's no research to be found on any of their current processes.

DS I could maybe put you in touch with Jacob Frye, who's the animator who's just worked at Pixar

CJ Is it? That would be so great.

DS Let me see if I can

CJ Please, because I know nothing, there's really nothing.

DS Because I – I think he'll probably tell you that it's mash, and that what happens is that they do all this research, and they do all this storyboarding and they keep – keep working on the story, and the story and then finally they run out of time and they just have to do things as possible.

CJ Ja.

DS And it will be interesting to see at what point is the song ready to rock 'n roll, and what version do they get, do they get a scratch that then becomes orchestrated later, or what?

CJ Ja, what happens? No definitely. So that's what I'm proposing. Thank you for your time.

[END OF RECORDING]

INTERVIEW 4:

Interview with **Kane Croudace (KC),** animator at Triggerfish Animation Studio, who acted as Shot Supervisor in the animation feature film *Khumba*.

Date: 30 August 2016

Length: 25:10 Minutes

Place: Triggerfish Animation Studio, Cape Town

CJ What were your responsibilities in the film Khumba?

KC I was shot supervisor which meant I saw all the shots through from storyboarding phase across to end of animation, looking for consistency, helping people with problems, helping to plan it out, which teams got what kind of work because certain people are better at certain things than other people. Making sure that all the technical deliveries from the other departments got to us in time and that all our work was done in time for the other departments to pick it up, uhm planning a lot of camera work and then doing some character animation and ja I think that's about it.

CJ What particular characters did you work on with the animation?

KC In animation I worked on the mantis in a few shots and I worked on the silly zebra, Nigel in a few shots and then lot's and lot's of characters I kind of touched on but didn't do like a full shot. I just fixed up that other people were struggling with.

CJ Ja. Were those particular scenes that you did animate like the mantis, were they assigned to you or did you ask to animate it?

KC Some of them I asked, some were just there was nobody else available.

CJ Mm okay and have you ever animated a dance scene?

KC Yes I have.

CJ Please describe the dance scene.

KC It was in a DVD thing for some company in the states with this frog that was having a kind of Las Vegas dream in his head and he was with the top hat and cane and walking around and then he did like dance with jazz hands and he had an infinite supply of newspapers that he threw out to make a spiral staircase that he climbed and he kind of danced as he climbed.

CJ Was it a long scene?

KC It was probably about ten seconds or so.

CJ Was there sound incorporated into the animatic of Khumba?

KC There was, there was some scratch sound incorporated just to kind of make it a mood base for the composer to go off of and the director kind of found music that he liked the feel of and ja just wanted that mood to be expressed.

CJ Was there in the other dance scene that you did, did you work from an animatic?

KC Uhm that, no that there was a very, very basic storyboard but then I got the track so it was easy and then I could make a uhm click track as well because that's actually easier to animate and then you can see the exact timing, much better and ja so I made a click track of it and then I kind of animated to the click track.

CJ To the click track rather than from the animatic. Okay so the musical or the dance scene specifically in that that little short scene, were they storyboarded in detail?

KC It wasn't storyboarded in any great detail. Uhm it was, I think there was like, I'm struggling to remember, it was quite a long time ago. Uhm no I think it was just like he dances now and they had a song that they wanted that was pre recorded so, I had lot's of freedom.

CJ To work from there. Mm okay so what did you receive that enabled you to animate that particular dancing? So it was the storyboards and the music track like you said...

KC Ja storyboards, music track and a brief from the director. Uhm ja and just general notes on the character beforehand, what his personality was, that kind of thing.

CJ Ja. How did you go about to use these, like your exact process from receiving them to handing in the animation?

KC So I get a brief to start off with, I'm about to start this and then the director said what kind of thing he wanted, what kind of mood. I think he pointed me in the direction of like Chicago kind of thing, all that reflective black floors and that kind of thing and then I got the music and I put it in and I realised it's going to be hard for me to mark each beat so I found out what it's bpm was and I made a click track to go under that and put that in so I could see that I could time his footsteps well and then I think I blocked it out kind of roughly uhm with the major extremities of each motion, just there as a guide and once I got the okay with that from the director I could go and fill it out.

CJ Put in the details and stuff.

KC Ja.

CJ Great. So you said you received the music. Was it the final music or was it a temp track?

KC I think it was a temp track. Oh it definitely sounded much better in the final product so I don't know if it was a temp track or just a really low quality sample rate of the real one, you know mixed down not very well but it matched. I have done some work on other shots or on other productions where we didn't even have a song yet. We just knew what tempo it needed to be and it's, as long as I find as long as I have a tempo I can get it because ja you might not be dancing very well but at lest he's dancing in time.

CJ Ja, ja, ja. Exactly. What was, what would you say is challenging about animating a dance scene?

KC What can be challenging is the tempo of the music used because depending on what we are animating, say we are animating for film then it's 24 frames a second so your

bpm kind of has to work out with that. If you get a number that when you divide it down to a second, it doesn't fall on one of the 24's but kind of in-between then it can be hard because you never really hitting the beat on a frame.

CJ Okay and for instance you did the frog dancing. Do you think it's harder to animate quadrupeds or like then human like characters?

KC I think it's kind of hard. Quadrupeds are hard because they touch a lot of stuff and you have to manage that but we so used to looking at humans every day that when a human is animated a bit funny we can tell immediately that it's wrong but nobody, well a few people spend so much time looking at a horse that they know that it's moving wrong when they see it. So it's harder but it's easier to get away with.

CJ Do you know of any specific method that animators might use uhm to animate music?

KC Uhm ja. Mostly well the method that the people that are really good with it in the studio at the moment do is they get the music and we have people who actually do dance. So typically they get the music and then they will go and kind of choreograph a dance by themselves and record that first and then when they happy with that, kind of copy it through the lens of the character and that has worked really well so that's how the dance sequence in Khumba was done where the ostrich is a ballet dancer, uhm was done in that way and on our current project actually the same lady is busy working on the same, on another dancing scene and they use that method. Uhm personally because I'm like a very logical kind of person, I like to you know get the click track down, try and convince the directors that it should be a bpm that slots in nicely and then kind of take it from there and first block it out really roughly to show the movement because I can't dance with my own body. [laugh]

CJ Mm no. Ja. [laugh]. Shame.

KC Very well anyway.

CJ Do you have any musical knowledge and skills?

KC I played bass guitar and guitar and a very, very little bit of keyboard and I know some musical knowledge but it's kind of half from primary school and half from playing music with other people who know a lot more about it than me so they would tell me what's going on and I kind of understand. But I can't you know tell you the ascending triads of the major scale or anything like that, not proper knowledge.

CJ Was the guitar and bass self taught?

KC Mostly self-taught, some internet lessons and some like I think three actual lessons from people who I paid to teach me.

CJ Okay great. So do you think you have an innate musical talent or an exceptional love for music?

KC I think I have an exceptional love for music. I don't think I have an innate talent because it seems to take a lot of practice to do anything that I want to do.

CJ Mm it's true.

KC But I can like imagine songs in my head and then work them out in a very kind of slow process of like no not that note, okay let's try, okay that note.

CJ Ja that sounds right.

KC Ja.

CJ So you do understand basic musical concept?

KC Ja I think so.

CJ I'm just going to show you a few that relate to animation specifically. It's just something you can keep but specifically uhm obviously timing, musical timing and performance timing works very much in relation to each other and then tempo which we know in animation as the beats per minute which depict track and such and then rhythm which will be the frames per beat.

KC Yes.

CJ And also then how to work that out and things interesting. So do you think you used your musical knowledge in all in anyway to animate the frog dancing?

KC Ja I think so, the rhythm and tempo.

CJ Ja.

KC Definitely needed that. Now I'm trying to see other things. I guess like the motive you kind of have to work off what the music is about. If it's about the same kind of thing as that part of animation then it really helps to reinforce it.

CJ Ja, definitely and if you did not use your musical knowledge and skills, what do you think something else that might have enabled you to animate the musical scene more?

KC I know that people who do like physical things like martial arts or gymnastics or dancing or anything that requires like fairly extreme use of the body are often very good at that kind of thing because they understand the body mechanics behind it so I guess you can get a more realistic looking movement in the dance from that and I suppose as long as you have that you don't actually need knowledge to have a click track in your uhm screen, that just shows you where each beat is.

CJ Have you ever used a bar sheet to animate music?

KC I have not.

CJ Do you understand how to use a bar sheet or do you know what a bar sheet is?

KC Is it a sheet with your musical bars on it?

CJ That's exactly what it is. Okay so just a bit of history, which you might know. Animators. Okay Disney time. In the beginning the animators used to, the music used to come after the animation. So the animation was done and then the music was an after thought which was coupled with that but then Disney did Steamboat Willy which was the first with synchronized sound and then it was very successful because the music and the sound really supported each other and then from there on they tried

to do a music before the animation itself but the animators then decided there must be an easier way to animate the music without going back and forth and changing things for the musicians and for the animators and such and this one particular animator, Wilfred Jackson had a very basic knowledge of music and he suggested but we have one thing in common and it's timing so why don't we use the metronome and the animators work from a set beat and the musicians do but we write everything down and then they work from one central point and that's where the bar sheet become prevalent. So this is just one type of bar sheet. So it will indicate all the beats and then in the certain amount of bars such as this and notation for music and then what happens in each frame. Early animators even wrote down the music on bar sheets, well while they were writing down music, the animators will write what will happen in that specific bar with the music and they will change things here and they will also have one central point from which the animators and the musicians will work from and then it became more detailed with camera angles and how, where and what shots should be but still timing very prevalent and the music was still, the animators were also able to see what music happens and such. Then now more lately the music is not so prevalent anymore and they use screens, shots and grabs and describe the action but they don't really see the music. They just I think go on audio track and listen to what they do and then today there's not even music, the music bar isn't included anymore at all and I suggest this is a bit problematic but that's just me. So I suggest well animators should have just a basic musical knowledge. I don't propose that you know how to read orgestration or all that, just basic musical knowledge. We will be demonstrating this by the use of that specific ballet scene from Bradley that he did the Swan Lake to. So this is Swan Lake but the full orgestration for that certain piece of music but it's twelve pages long and I do not suggest that you will be able to understand everything and play any instruments but obviously the main theme here is that (singing) da da da da da da da that we all know so well and that central theme or motive can just be incorporated from twelve pages into this one page and that's basically all I suggest that animators will need along with a basic musical knowledge which will be just basic terminology such as know what andante means, the tempo at which it should be played, uhm the mood terminology which is dolce espresso which means it should be swiftly but still very expressive and be able to know the dynamics which is piano and forte because then the animator will be able to see that it builds up to here so he can maybe, he or she can maybe plan the animation accordingly and know bars and how much beats goes into a bar and such to then work out how many frames there will then be and ja that's the musical knowledge I suggest but along with this they will receive a click track and then with the right and correct timing and the audio track and then this piece of paper right here. Then this is, ja basically a bar sheet with the basic musical, the basic music theme and then the action will be written down here and maybe here the character prepares himself to do a turn or something and then it builds up towards this because you can see it's a high point in the music and you can also hear it and ah then put in storyboard frames or initial ideas about movement and the title will be written down, the tempo will be either given or like you say we can beats per minute, we can work it out and then work out how many frames there will be in a beat or a beat and beats per bar. So the reason I'm suggesting that animators do it this way is because I think it's nice to have everything on one page. You can see the totality of what's going to happen instead of on a timeline where we can only see a few frames or I don't know it's not a complete view of what

happens and I think this will be great for timing and planning purposes as well and maybe enable the animator to animate music more believably and yes. Do you think with this basic musical knowledge and maybe this method will enable them to animate more efficiently or believably?

KC I think it would depend a lot on the kind, the medium of animation. So for like stop frame I think it would be essential to do but as soon as you go onto a computer because you can output something along with the music all at once for your director to see. While it might be handy just to make notes and plan a bit, just because of how easy it is to get sound and picture together these days compared to the early days of Disney, the director I think would want to make his decisions based on that so ja I'm not a hundred percent sure. Like in computer animation if it's will be useful as like a rosetta stone kind of thing, definitely for planning, especially if someone understands musical notation a bit and then can work on it.

CJ Also, I know we living in a digital age and I'm talking specifically to 3D character animators using computers so I should have mentioned that but this will be digitised and then make it easier for the animator to update what he is doing and maybe it can even be shown alongside the reference footage and where the animator can work in and maybe he can work as a plug in Maya, I don't know. I'm not really into that technical stuff but just to see and hear everything together even if it's on a screen, will maybe ja be a more effective way.

KC Ja I think where it will be effective might even be with people who are not that good at listening to music and they more visual people because. Like some people just think to music and you say come in at the crescendo or whatever and they like maybe there's a bit of pre crescendo somewhere else and they don't really know what it is but you know it's easier to see it with the black dots that there's a lot there so I think it would give a good queue on like the extremity of the movement needed so you can build it up. You can plan that much more easy than listening I guess.

CJ Would you say that you like you just said you know build up towards the crescendo but would you say that you if you talk to an animator and you tell him listen you doing this wrong, you should build up, do you think you use music terminology like you just did? Just for interesting sake like you said build up to the crescendo of the music, do you think you use that?

KC I think I would.

CJ It's really interesting. Cool. Okay great. That's basically it. Thank you so much for your input.

KC Pleasure.

CJ You can keep this as well just for knowledge sake and yes thank you for taking the time out of your day. I know you are very busy with rhymes and everything.

KC Thanks so very much.

[END OF RECORDING]

INTERVIEW 5:

Interview with **Nico Venter (NV),** freelance animator in Cape Town, who studied at The Animation School.

Date: 30 August 2016

Length: 37:49 Minutes

Place: Animator's Home, Cape Town

CJ Have you ever animated a dance scene?

NV A dance scene, no, not a dance scene.

CJ Do you know of anyone who has?

NV Yes.

CJ Do you, can you describe the dance scene?

NV Yes it was for, it was for one of, well for a couple of the shorts done for the end of year, for the final year project, of the 2015 animation students films. I saw a couple of them, I'd have to think about it, dance scene. I actually know in second year already yes, a guy dancing to classical music, ja.

CJ Okay, if you would animate a dance scene, do you think the music would be incorporated into the animatic for planning purposes?

NV Crucial yes. So before the animatic I put it in, I think I'd have the music before I have the actual, before, before the storyboard.

CJ Okay and, will, so the animatic and the, sound incorporated, will it be to the precise correct timing, such?

NV Uhm, specifically at the animatic stage, where you start blocking the animation?

CJ Mm, or before that, or even still in the planning phase.

NV I think it's a, it's a, in a basic way, in the process, is I'd first get the, yes as much as possible. Although leaving, leaving space specifically for animators to, to imbue it with their own creativities is, is much more important than, than like, then I realized. I directed one of the shorts and, meticulously planning a shot didn't work out as, as nice as it did when, when they get to, like when the animators get to feel their own ideas into it.

CJ Mm.

NV But for the most part as this, as a general rule, just to know the timing, how long the shots need to be, and to know the sequence of events, then ja.

CJ Okay, what do you think you will need that will enable you to animate the dance scene? Like for instance the music and the precise timing, so the animatic I would say, but what else do you think do you, would you need to animate a dance scene?

NV What do I need to animate a dance scene, I think just, well context I assume. I'm just trying to picture the, the setup or the context. So I think what, what you need is, is as

much as possible so if you know, if you can get a surrounding story about what your, what you're doing it would be, it would be best.

But other than that the most important thing is, for a dance scene is, is obviously the audio, and your working with a visual. So, I mean, those, those are the two predominant senses that your working with, uhm, ja.

CJ And, how would you go about to use the audio then to start planning and animating the scene?

NV Aah, first look at the beats of the music, so, so in the same way that you would take a story beat, I think in the same way that I would approach a script. So look at, at the different, at all the different parts so that you can break it down into sizable chunks, and then from there so it's even smaller and smaller and smaller. I think first really listen to the music, like listen to the music over and over and over, and from there just decide on the different, the different emotions, so I think specifically with music this, we have such a emotional connection to it, to see, well to feel where the pace changes, which, and the pace marks the story of it.

CJ Mm.

NV So first get a feel for the story, for the arc, and then from there pretty much break it down into smaller bits of its beats, and then plan it out as far as possible, with drawings or whatever and, and then start the storyboard animatic animation tweaking and that stuff.

CJ So if you receive the music beforehand, will you just listen to the music and analyze it or will you, for instance look at the music score or sheet music to, you know, maybe?

NV Aah, I didn't consider looking at the sheet music, no I don't think necessarily the, the sheet, for me personally I don't think the sheet music would be that important, it would be, for me that relates very much to the, so it's, to seeing the code behind, behind Maya or something to see how, how like the backend works, and if you're not dealing specifically, if your role or, or to put it in another context, so if you have to fit in a form on website you like, you don't need to know the code, you just need to know what the website looks like and how to interact with it, and I think in the same way, that I wouldn't necessarily look at the sheet music. Uhm, unless off course there's a specific reason for it, but otherwise no, no just I listen to the music, [laughs], cause otherwise like it's just hardcore musicians who go wow, like that note, unlike aah.

CJ Ja.

NV Maybe they would, but no I don't think I would. Me personally.

CJ How would you determine the correct timing for the musical scene?

NV Aah, the correct timing?

CJ Like planning out where what will happen, will you go with beats per minute and then maybe use a click track, to indicate the metronome beats of where everything happens along with the music, or would you act it out…

NV Ja, so physical reference I think is also incredibly important, like the difference between an actor and an animator is miniscule if there is, so definitely this is acting it out and, you know if, you can get reference of a, just not necessarily a professional dancer but someone who dances, that is immensely helpful. Other than that, usually from my personal experience it's only been frames, so it's usually frame count. That's

how, so that's how I've been trained and that's how it was taken from everyone who knows a animator survival kit, so that's how the old Disney guys used to count beats, is with, is with frame count. But ja, so I'd say usually, and all the animators that I've met are usually according to frames. So, when they look at like a fast turn or something, or like an, an airy flow it'll, so they count it in frames.

CJ Mm.

NV Which, is something which I assume will be the same for music when they have the reference for it, so when you shoot the reference you'll see and then they realize, ja.

CJ Mm, analyze it. What do you think will be challenging about animating a dance scene? Do you think it will be, more challenging than a normal animation, or just a normal part of animation?

NV I think the challenge will probably have its own rewards system as well, cause once again, like with the animators that I worked with, the more challenging a shot gets, the more reward they reap from it, the more they actually work on it. So, stuff that feel or seem harder to do is obviously more intimidating but as soon as they get into it and as soon as they get something that works, like some kind of reward out of it, some kind of gem reveal itself, that usually pushes them even further. So I'd say definitely it's like more difficult than an average, like someone sitting down or because the emotional connection is different.

CJ Mm.

NV So there you just need the principle of like weight, whereas in a dancing you really want to, like that's where the hands and the eyes just have to really just, not only the hands and the eyes have to work their magic. I think then like it kind of goes into the hips and the whole body, and just the whole character has to personify the piece of music. Aah, so I think if done right then, then most probably more difficult.

CJ Mm, do you know of any specific method that an animator might use to animate music?

NV [Laughs], you know the only one that I've come in contact with was the unorganized one, like the, listen to the music and just brainstorm through, 'oh wouldn't it be cool if', aah that process, which I assume is a bit more, it's more time consuming but it's a bit more organic than just left brain analyzing the piece of music and then going from there.

CJ Mm.

NV Uhm, I think, it would probably be cooler just to have it done in groups. Aah, as, like the brain assist through more than one person so better ideas are just generated, it just happens that way, and that's how, I think that would probably be the best way or process, or at least that would be the best start of the process, how to come up with like a dance scene. But further than that, the actual technicality, I think it depends on how you were trained, I think it depends on what is easiest, it's the same like what is the best process to paint a picture, you know, like some people prefer to like render throughout and other people like, they just love the chaos. Most people I know just love the chaos, ja, so.

CJ Creative mind thing.

NV Mm, ja, chaotic organized.

CJ Ja, ja chaotically organized, ja it's designedly finished.

NV [Laughs], ja.

CJ Do you have any musical knowledge or skills?

NV Aah, so it happens I do have some historical, musical skills. I've got grade 5 classical guitar. And I played for about seven years. Uhm, only like classical, yes.

CJ Did you go for lessons, or was it self-taught?

NV Ja, no lessons. So I had a teacher who taught me, what I assume is like the Unisa syllabus. I think so, ja so you do the scales, you do the apeggios blah, blah, blah, ja.

CJ Okay, and would you say you have a innate musical talent or a exceptional love for music?

NV Love for music yes, ja I feel that is, ja there's some truth in what a friend of mine told me once. He said that if you had to compress heaven into this world it will be manifested in two things, music and honey.

CJ [Laughs].

NV That was so beautiful, I can totally relate to that, so yes, no music is one of the things like right up there, ja. Uhm, natural talent I don't know, there was obviously people like a lot better than me, [laughs], so I don't know. I loved it, so I think that's about, ja I didn't really care how good I was, as long as I could like do something that sounded like okay to me, ja.

CJ Mm, ja, so do you understand basic musical concepts?

NV Maybe, ja.

CJ Okay, so I'm just going to tell you about a few things which you would probably know, and this is just the paper, I'll explain everything now. So just a few that relate to animation specifically that I don't think we always think about, that are actually really quite obvious are timing, is timing, musical timing is obviously parallel to performance timing. Then tempo, which is music, also, in, you know we work with beats per minute in animation as well, and then the rhythm which you, as you said, is the beats, ag frames per beat, and how everything revolves around that, and that's also three major concepts which is the music as well. So I think music and animation has a lot more in common that we actually realize, maybe not on the surface but, you know, the core of music in general is timing so I think animation also and ja anyway. Do you think you would use your musical knowledge, even if it's not like intentionally, to animate a character more believably in musical scenes?

NV Probably not intentionally, because I always used to suck with theory in music anyway. So maybe it's been always much more internal and much more, feminine. Much more feeling based, and I think like that's where my love for music also really lies. And, so surely that is what I would use when listening to a song to determine how to animate it. So I assume we can say yes, ja.

CJ If you have a look at that list there at the bottom, which of those musical terms or concepts, would you say would you use to animate a musical scene maybe?

NV I would use to like as terminology to explain how to animate a scene?

CJ Mm, ja, or maybe just use as, like for instance I'll use timing, definitely, it's one of the core things, that obviously you have to time the music to be precisely correct with the animation.

NV Mm, uhm something like andante I don't think is like moderately slow, you can just say slow.

CJ Ja, ja, ja.

NV The beat, uhm, I think dynamics. Uhm, motive, ja, I think orchestration could be nice. Uhm, ja tempo and time signature, rhythm obviously, and maybe pitch. Ja, cause I agree with you, like some of them would clarify, so it's the, conveying a, the abstract. But obviously it's in a hierarchal way, so something like andante wouldn't, so no one would use that.

CJ Ja.

NV But something like, as you say, rhythm or pitch or something, so I think that might be, I don't know.

CJ [Laughs], What other skills or knowledge do you think one would use to animate, not specifically in a musical scene but like ja?

NV Acting.

CJ Acting, there we go.

NV Totally, totally 100%.

CJ Okay ja.

NV Aah, ja, I think that's actually, funny enough I think that's one of the reasons why I don't feel that I've really ever connected with animating as such cause the best guys in the class are the guys who were drawn to animation so much quicker, and the guys who developed the skill so much quicker were the guys who were able and willing to put themselves in a situation, where they can act and like be someone else, and to step in front of the camera, that kind of thing, and sort of live in this fantasy world. Aah, ja that is just to see the quality of work that come out of that is, is really cool.

CJ Mm.

NV Ja, so, so acting, so like acting is right at the top.

CJ Pretty up there. Have you ever used a bar sheet to animate and dance scene?

NV No, I don't think so. Has anyone ever said yes to that?

CJ Yes.

NV Okay.

CJ Ja, so, I'm just going to give you a bit of a history lesson. So as you know Disney is one of the forefront animation leaders and well animation studios, we will refer back to with the 12 principles of animation and stuff, and uhm, okay in the early Disney years music was always done after the animation.

NV Crazy.

CJ So, the animation was done and then the music was just an afterthought which was slapped onto the animation, and that's how it was, and then synchronize sound was

invented, and came out with Steamboat Willy. It was a great success because now the music actually matched the animation. Then sound was added beforehand, or even could develop with the animation. Then the animators decided, but listen, there must be an easier way for us to do this whole process without going to so much back and forth between the animators and the musicians and, whatever, and this one guy, particular animator, particularly, he had basic musical knowledge of tempo and beats and whatever, and he decided but music and animation has both, are time driven so what if we use the metronome as a basis for, like doing everything, and then he discovered the bar sheet, and the bar sheet is this, this is a bar sheet. So, what it entails is that it has, bars, like a music piece of paper, would have, and then all the beats are indicated in this particular bar sheet on the bars, and then the animators will write out what happens, like the words or actions that will occur in a certain amount of frames in a bar. It was also done in Disney's time on music paper, where the musician will still be writing the music, and the animator will write what will happen in each frame, and then this will be changed and developed together. So the musicians and animators work is very, closely together, so you get the perfect fit and, then start animating this scene, particular scene or whatever.

NV Mm.

CJ It then changed more to a like structural layout where the music was still prevalent and, but more organized and more camera actions and everything that happened, the precise timing.

NV Like a, like the whole storyboard pretty much.

CJ Yes.

NV Like the blueprint of the storyboard.

CJ Ja, basically, summed up in a page, or a few pages, and these days animators still make use of bar sheets, some do, but as you can see the music is falling away and they're just looking at, having screen shots or initial drawings and then actions that happen and where, what should happen, but still using the layouts of the bars to indicate where certain beats and stuff will happen, but now we're sitting in a, okay it's the latest bar sheets used, the music has totally fell away and they only look at the actions and dialog and what should happen on screen.

I'm proposing that with the basic musical knowledge you will be able to animate a dance scene more believably by going back to, the old Disney ways of using a bar sheet, but with incorporating it with new ideas and technology. So when I say animating, ag in basic musical knowledge I don't intent for anyone to be able to read an orchestration piece of music in any way. I'll demonstrate this by using Swan Lake as an example, so this is a, this is a Tjaikovsky full Swan Lake for the orchestra, that it, that's how it's written and it's 12 pages long and it ends at a very busy note, and this is not what your supposed to know at all. There's a basic theme in every song, which is the main melody and such, and then Swan Lake specifically is that, [sings melody], which we all know so well, and that can be summed up in one page. So from 12 pages to just one with the main melody, and that's all the animator actually listen to when animating a scene, you listen to the main music and the beats and where everything happens, obviously this is a bit different because it doesn't really have a drum or anything because it's ballad, but anyway. So the basic musical knowledge I suggest an animator should have and is just basic terminology, like for instance know what, tempo, these are tempo indications, so [indistinct] says, means quite slow, which the

animator will then be able to hear as well, but then visually just see, okay it will be quite slow, dynamic and science, which is then piano and then forte, maybe that's important because you can see where the movement should be built up to that climax of the music. You will be able to hear it as well, but I think to see it just makes a bit more sense and using more than one sense to hear and to see things together. Yes, also then I just propose that they should know that pitch in relation to, some notes are higher than other notes, and, for instance for higher notes you will maybe have a lighter movement, or for darker notes you will have a more grounded feeling. Then still use the bar layouts to have the timing and know what notes or what your sound falls on what beat to animate to. So this is the layout that I'm proposing, it will be a bar sheet with the bars indicated, and then the, just the basic musical line, the title will be written down, and then the tempo which will be in beats per frame. We can use the beats per frame to, ag beats per minute, sorry, to work out the bars that will, ag the frames that will be in a beat and the beats that will be in a bar so that the animator can then like count the frames and work out how many frames there will be in a bar, and what ja, to where they should work. Also then the actions will be written down, as to where what will happen, and then drawings and initial sketches can be entered to guide his visual ques, as to what should happen next and, then you can see in one page, where you're going to, are you going to, actually going somewhere and not just standing still and, I think the way, the reason I'm suggesting that it's in one page is that it's compact and not messy and everywhere. I'm quite aware that we are living in a digital age so this will be maybe computerized, digitized, and then the music will be updated and you will get the audio track as well as the click track that will indicate certain beats, and then the layout where you can insert your storyboards and actions and then work from this as a reference to animate your particular scene. It can even maybe be, be a plugin in Maya, or a guide that will be, ja maybe on a program on the computer where you can even have your reference video along with the bar sheets at the bottom where you can say okay this shit happened, where you can make notes and such. So, that's my proposition, do you think that these basic capabilities, music competencies will help animators and what do you think about the method and such?

NV So this is where I get to give my opinion?

CJ Yes.

NV Okay, I like the idea that, that with this, that you can tell the animator exactly where the frame, where the different frames would be, because if you only have the piece of music then it's all general, then it's, then a lot of the timing you have to work out yourself, but, what I really like about it is that, so that you have the timing, so that you have the timing down, everything is already there, and to update the stuff, especially if it's digital, kind of, so it's in the same way that google document would be, then everyone, then you can see the thing progress and you will always know what it happening, so it's where, in which frame what happens, but then I would almost suggest like a hybrid. Ja, because this is for them, for them to have pure sheet music I think is a bit hectic, so I wouldn't give them pure sheet music, like with, you know, with the sharps and the flats and stuff, I feel that, that might, you would almost need like a, like an in-between language. In the same way that, you know you download, you, you'd get sort of like knock off, like knock off sheet music where you can see the strings and, and you know that stuff that stuff that you can strum and you can, you can read it so much easier. I'd almost suggest something like that, that you can, where you don't necessarily need the sharps and instead of, instead of like what the 45, you know, the normal bar you'd have, 6 or, oh well that would only be functional for a

guitar, but ja, essentially just sort of like a, sort of like a cheat sheet somewhere between the two.

CJ Mm, ja so simplifying it.

NV Ja, so almost in the same way that you had it here somewhere, sort of like here, cause I think this, this gets a bit wild again. Something simple, somewhere between that and like these two, where you can have, where you can see, so it's, but obviously so it's that with your, with, with this as a base like where you can see, where you can see where the beats are….Ja, so if you can take out like, you know, that kind of stuff. All the stuff that might confuse them a bit more, I think that will tell them, who knows, man I think it will definitely activate something inside them as well to actually read it. So it will, I almost want to say like reconnect that, reconnect the dots of the feeling in a more precise way.

CJ Ja.

NV So, ja, I think, it's definitely useful, it's definitely useful.

CJ Do you think in terms of program wise, how would you go about implementing this? Like at the moment I don't have an idea of how you would, I drew this up on Photoshop.

NV Oh.

CJ So how would you go about… [intervenes]

NV That's all you need, I think if you, so it's, what you need is are, is or are programmers and a musician, and they will be able to, as you said, like write a kind of a plug in, I think a plug in for Maya, ja I think that's essentially all you need.

CJ Mm.

NV And something that you can, like probably a plug in for Maya that, almost more like a shortcut that takes you to, to like a google drive, where it can be updated, because I don't know if you know, there's a lot of differences, updating systems, or producer systems that like shotgun and a whole bunch of others, I think Auto Desk also has one of their own where, where you have, you know, schedules and stuff, and I think in the same way that involved that you need like, almost like a smaller one for this. That uhm, that can, that can speak the two languages.

CJ Ja.

NV So only, ja so I think that will be, making the program and everything will be pretty basic, I think where the difficulty would probably come in is how to develop the language that you'd use in the program, so the hybrid between actual sheet music and the sheet music that the animators would use, I think that's probably, that's probably where, where, where the, where it will become difficult, ja. Obviously it would be ideal if you can, using that program, if it has its own set of rules that you can, so it's that, that someone who reads music or in a music, or a musician can write like in their own language and it, like it has a bunch of rules, obviously fairly simple and they write in their own music, but the way that it translates like onto the actual thing, is different because I know there's like Guitar Pro 4 or something, there's a whole bunch of sheet music programs that you can use to write sheet music. So if you can take that model and just make it like a what, trans, change.

CJ Change, ja a…

NV Like a translation, aah ja, so all you need really is a programmer and musician, they'll be able to do it for you.

CJ That's great, thanks so much, thank you very much you can keep this, this is a, a nice piece of memorabilia.

NV Ja, memorabilia, Photoshop memorabilia.

[END OF RECORDING]

INTERVIEW 6:

Interview with **Samantha Cutler (SC),** animator at Triggerfish Animation Studio, who was responsible for animating the dance scenes in the animation feature film *Khumba*.

Date: 31 August 2016

Length: 40:34 Minutes

Place: Triggerfish Animation Studio, Cape Town

CJ What were your responsibilities on the film Khumba?

SC I was a modeler for a few months if I remember correctly and then I went on to animation. That was it.

CJ What particular characters did you work on?

SC I modeled the main characters like most of the zebras and Khumba and Pango and then there were babies and then I animated a lot of Bradley the ostrich and Khumba but it was all mixed so I animated a bit of everybody I guess. Ja.

CJ And did you choose to animate particular scenes or were they assigned to you?

SC No, they were assigned to us per team. So we were in teams of three and then we had a lead and I think if I remember they just assigned like whatever scene was ready.

CJ Even the musical scenes?

SC Oh for Bradley's dance, he had a dance by the campfire which I knew I might get. So that they gave us the scratch track when we were modeling still which is actually very fortunate because it does not happen normally and then me and my friend Abbey kind of choreographed it together when we were still modeling. So it was like animation had sort of started... Some of the like previous stuff I think so there were early stages and then much much later in animation then we actually started animating on it but a lot of things had to change because of camera and then the scene was split up over a bunch of us so we all animated bits here and there, not everyone followed the choreography exactly so it did change quite a bit and then obviously the music when we got. But I don't think we actually got final music till or even heard the final music. I think they did the final music after we were done animating so that sucks. And then the Swan Lake one was an idea of a friend [unclear] had. He came up with it just as an idea and he pitched it and they liked it so much. It

wasn't actually in the movie at all and he was like oh it's so funny and he drew these beautiful storyboards of the ostrich doing all wafty stuff and they loved it so much they were like okay we will put it in and then me and him kept fighting the whole production because I wanted it because I was like it's ballet and I do ballet and I should get it and he was like no but I made it up and mm so it was ping pong between us like for most of the production then eventually I ended up with it and I was like yay and then I felt bad for him. He then later on he was actually kind of happy that I got it because it was a bit complicated but love that scene so happy accident.

CJ Were those the only musical scenes that you did in Khumba, the Bradley dance scene and the ostrich?

SC Oh there was also the dassies. I forgot about the dassies.

CJ And the dassies.

SC The dassies was quite quick though because we knew what their song was, what they were going to say. There wasn't audio work yet and it was probably also just a scratch track and they really liked. They had that dude, I forget his name. He was Twakkie.

CJ Ja I know exactly.

SC He came in and when he was pretending to be a dassie because he did millions of the scratch voices. He did this really stupid flappy dance thing and the director loved it. So I took that and kind of fiddled with it. It was really simple and it was supposed to be silly because its dassies and also they were very limited in their rigs so even when we were animating it was like they can't do this so quite hectic ja.

CJ So do you think for interest sake the musical scenes would have been incorporated and especially the ballet scene, Swan Lake would have been incorporated if you weren't on the team for instance because I know a lot of uhm.. Like you have a very good musical knowledge so do you think maybe if there wasn't someone with a good musical knowledge, the scenes would have been not put in or what?

SC I think if maybe the Swan Lake, they all still be there but they probably wouldn't be as dancy. It would just be more of him just sitting and singing and the Swan Lake one probably still would have been kind of balletish but I don't think it would be as true to Swan Lake. It would have probably been more of like a someone's interpretation of what ballet is.

CJ Not actual ballet dancing. Were there or was there a music incorporated into the animatic?

SC Ja it was scratch tracks but it was a bit of a stuff up because even in the final music recording they did, they didn't sink it with my animation properly so it shifted so it kills me to watch that scene now, the campfire one because it's off.

CJ Really.

SC Ja but like no one else notices and I'm like mm it's in the wrong place but then I think it catches up because they ended up editing out the first half of the dance so it's in a different order so it doesn't flow how it's supposed to so I think that's why the music is a bit off but. Sorry I forgot the question.

CJ Ja was there sound incorporated in the animatic?

SC Oh ja. It's always scratch tracks so it's sort of there to help you so you should maybe follow like the main beats but uhm it might get like redone and be completely different so you can't, you not supposed to follow it exactly. It's just maybe pretty much just the main beat but it's tough because we actually. That guy Twakkie did like the funniest scratch track for Bradley. I actually prefer his voice way more than the fancy actor guy that they got and he was like and his toes and stuff were like all over the place and high and low and it was just so interesting to listen to and like in the dance there's like a part at the end where it goes like aah, ooh, mm and they would do all these silly things to it and then when they actually did the final audio then the guy that sang the proper version was like blah and that was it and I was like that was so boring.

CJ It doesn't work.

SC Ja and then like we left the dance as it was but it didn't mesh as well.

CJ Ja. How detailed were the musical scenes in the animatic or in the storyboard phase?

SC Detailed. How?

CJ Were there specific movements drawn in or were you able to use free reign in terms of?

SC It was more like he's by the campfire and he needs to. I think they knew that they wanted him to move about but they didn't know what they wanted him to do. So when we choreographed it we said okay they've got this camera angle, what would look nice in this angle. So he was kind of like wombling around the campfire and there's like parts where he goes behind Mama V and Khumba and so it's like how would. So they did have sort of an outline of what we must follow so there was something to build off of I guess.

CJ And what did you receive that enabled you to animate the musical scenes? So you received the scratch track like you said and then what else did you use to animate the musical scenes?

SC Mm that's pretty much it. You just stick to the script, the scratch track and hope that they don't make the sound too different when it's done because I literally only heard the final whatever and I actually watched the movie later and I was like okay.

CJ This is different. [laughing] And how did you go about animating a musical scene? What was your specific process of doing it from receiving the task from the director until like ja?

SC I think it's definitely to go over the storyboards and the animatics. So you have got your camera angles and like a brief on what the director wants. They always. I think Khumba was kind of allowed to. Like Bradley's telling his story but then it's like sometimes oh like this character and this character, they like telling a story to the song or whatever. Ah I've lost my thought process again.

CJ How did you go about to animate the musical scene?

SC Okay. Right. So then the [unclear] they would have their specific thing and then I'm crazy over reference so we are in Khumba I knew it had to be kind of like jazziness and then we thought that would be quite cool for feathers as well. So we did a bit of research on the dancing and then choreographed like something basic and then at lest we had the scratch track so we kept like oh this goes really well with this bit and then we went back to all the camera angles and then filmed me dancing it from all the different angles and you can see what works and what didn't. Uhm and that was really nice because then we were animating like your reference is done. You just follow and then exaggerate it. So that's pretty much the process but like the more the director gives you the better. Like on the production we did now, the dude is so specific it's crazy. He literally gave me like tons of reference of dancing. He's like I love this and I love this and I want this and so I was like okay. I try to take everything and moosh it together. It's like a lot of information to process but ja if you get it a strong brief, it helps so much. Like the whole process even into animation?

CJ Mm.

SC Okay. So then once I've got my reference I would normally go through it to choose which are the main poses and then I take screen grabs like just jpegs of it just the main poses and then I flick through it and then I always write down what frame number the jpegs are on and then I copy those poses with my character and I try to push them as exaggerated as much as I can and then oh because I've already got the frame numbers of each pose then it's so easy to time it because you've already done it to the music so you just timing pretty much there but then the problem is when you smooth everything is all floaty so then sometimes you have to really exaggerate the timing even more. Like you want them to hit the pose like and overshoot and everything. So I just go crazy, the animation but uhm you have to be careful because sometimes it ends up looking too rotoscopy and I think Khumba I didn't actually push it enough. I think there was too much of a noob. I could have actually made it better uhm whereas now I'm like oh it can go even further. He can really exaggerate the timing and do things that are humanly impossible like make them hover in the air for very long and in like quick lands and things. Like it looks so cool in animation but you wouldn't actually be able to do that. Ja but Bradley was hard because his knees bend the wrong way so I had to choose certain steps that are Swan Lake like Swan Lake is very like her arms and pretty, romantic poses but uhm had to choose things that weren't dependent on lot's of plie's and bendy stuff because it just looks so weird with his legs going the wrong way. So I just did all these like straight arabesque and like straight leg things and it looked nice because no one even notices that it's like an ostrich leg.

CJ No, not at all. I didn't think I would ever consider that and I was like.

SC I was like oh I want to do this and I want to do this and I open the character and I'm like ah..

CJ Damnit, that won't work. Did you ever work from sheet music. Well obviously you didn't have this sheet music because it was just a temp track.

SC No it's always. That's the problem it's always something very rough. Like even now they obsessed with the song I'm animating to and everyone loves it and it works very well but it's too expensive to buy so they like animate it and then we going to try and

make something similar. So like I'm really scared for the final product because we really animating to like every little trumpety thing and acting to the music and I don't know what they going to do but ja.

CJ Oh well. So cost is really a big factor as well.

SC Ja. It's a lot cheaper I think to do something original and uhm I think because of the animation they always do like the final mix at the end. It's always left to the final thing so animation has to be done without it which is crazy.

CJ Ja it is crazy. Uhm okay what do you think was challenging about animating the dance scene? Like you said now his legs.

SC His legs. Uhm the rigs were awful. Like everything I suppose you put them in they would get these massive holes in their stomach so we had like millions of extra controllers all over them to pull out and make them look better so that was a stuff up and then uhm but they weren't too bad, they were just mostly like hopping in one pose so it was sort of okay. Bradley was, his legs and his feathers like every single feather was rigged and then some people, this one guy on my team, he does the most stunning animation but it's very like fluid and floppy where I think in the beginning with Khumba the style was actually supposed to be more snappy and we all kind of didn't stick with it. So that meant like on the dance it had like all the feathers, every single time and every pose you did and then even on the in-betweens you had to check that the feathers weren't intersecting because when they put fur on it, it would look really bad so I had to make very pretty feathers so that took forever and his tail as well so there was this. I don't if it got cut out the movie, I can't even remember. I haven't watched it in a while but there's this part where he likes shakes his butt at the end and there's like butt feathers and everything secondary so it took quite a while.

CJ Yes.

SC It's a lot of just like forcing the rig to do what you want because I would say I put him on point, the ostrich and the rig is only supposed to be like standing on the toes, not going like that so this is like breaking the rig so it's funny. What else. Ja it's just sort of see how far you can push it to tell the story. It's tough.

CJ Do you think it's harder to animate a dance scene than a normal animation scene?

SC Ja because you have to stick to the music and you have to exaggerate it a lot and it's not just ah she runs and then she does this and you can just film it and it's quick. It's like the on the one we on now the director he obviously doesn't have a dance background and I think his view of stuff is quite different from mine. So he'll. I will choreograph a piece and then I will show it to him and it's like me and my friend jumping around outside and he's like okay, I really like that but I just don't like this one thing and I'm like okay well let's go into animation and then we can fiddle. So then I do like my first blocking pass and then he just like love this, loves this and then I figured out that he hates like the transition steps which you actually need to get from one spot to the next and I'm like it has to be there. Ja like how do they get over there and they got to get over there because you like that bit so it was really hard to try like still be good and be like okay yes you want this and be accommodating to them but it's tough because then you also have to keep on the music and he's like ah but I wish

that they could stare at each other for longer and I'm like ja but the next count of music they got to start moving again. If they stay on there then they going to be off.

CJ Ja the beat won't be aligned.

SC Ja so it was super tough but there was like even the one day because he said oh he doesn't like this bit and he likes this bit, we eventually took like my capture of the animation and took it into like tune boom and like retimed it and fiddled and took stuff out and drew like stick men over it and we were like okay this would work and then we sent that to him and he was like okay. So it's quite a tough process and it takes a while but it's definitely worth it and I love dance stuff. It's fun.

CJ That brings me to my next question. Oh wait before that question. Do you think it's more difficult to animate humans or quadrupids than humanoid characters?

SC Humans are probably more tough because everyone is a human and you can see when something looks offish because you see people every day whereas like animals and stuff you can probably get away with a lot more and cheating it whereas if you animate something badly and it's like a walk cycle or something and it's not like exaggerated and they trying to be realistic. It's just like ah it looks weird. So I think in that aspect I would say humans but I think some people are scared of quadrupeds but it's just silly. I don't think it's too bad.

CJ And do you know of any specific method that an animator might follow when animating to music or do you think it's like a personal thing?

SC I think it's a personal thing because every single animator is different and we all go about using completely different methods to get the end result. Also if you are on a certain production like on the one we on now then they kind of force us all to animate the same way so the directors can understand where we going easier but it was tough because everyone was like oh I don't want to animate like this.

CJ Oh ja. Okay. So do you have any musical knowledge or skills?

SC Like I sort of play the ukulele but I'm very sad at it. Anneke is trying to teach me. It's pretty much mostly through dancing because I have done that forever and I don't know. I think everyone sort of has sort of a natural ability with music or hopefully most people.

CJ From how long have you been dancing?

SC Since I was like 9 or 10 which is actually quite late to start. Ah that's what I wanted to say because I went to the national school of arts because I was set on being a ballerina and then [unclear] and it was quite nice though because it came with, I got like dance history music and anatomy with dance as my subjects and music was really nice but I would say most of the stuff I used was more dance related then music related and then anatomy was really helpful because they used to make us do strange exercises where like you'd get an exam saying what muscles do you use in a tande or something and then you have to stand up and go like oh okay and then write it all down. So that is all crazy helpful in animation because you are like what is actually moving in that movement if you want to get like crazy technical. So that was helpful but music is quite tricky. Ja I don't know.

CJ Do you understand basic musical concepts and how they relate to animation?

SC Musical concepts, how?

CJ Such as timing and rhythm and tempo for instance.

SC I think it's good to have in your animation but then there's also like you would have to randomise timing and things because if everything hits on the same beat then it's going to be very boring for someone to watch so you always need to check your animation and see like is it like an interesting or something in there so it's interesting to watch. If you have a piece of music that just goes dong, dong, dong then no one really cares but if it's got like some interesting variations or randomness to it that makes it more appealing. So I think in that aspect.

CJ Well okay so this is a list of things that I will discuss with you now just to tell you a bit about things that I don't think we always realise but what music and animation have in common like timing, musical timing is very similar to animation timing and we use timing for everything and then tempo is the same as pasting in animation and ja it's worked out beats per minute which we then use to work out the frames and whatever and then rhythm which also relates to time and then specifically to beats, ag frames per beat and just included, you probably know how to work out the frames per beat but just included it there for you. So do you think you use your musical knowledge to animate the character more believably?

SC It's really tough. I think most because they so fussy like uhm before you even get to like a sort of musical timing of things there's like so much that happens before like pose wise and things. It's really hard.

CJ So don't you think your knowledge of dance and such helped you?

SC No it helped me a huge amount but it's sort of the way I think about it is different. Like probably most people then do use it but then it's more natural then they physically thinking I shall use music. It's just like a.

CJ Subconscious thing.

SC Ja, I would say.

CJ Ja I also think timing and such and I think musicians or dancers have a natural, you have to feel the beat and that maybe for me I think that helps a lot in animation to you know where the beat must fall and certainly I think. Sorry I'm jumping the gun but yes and you said other knowledge and skills that you would use is your performances and the like the physics of the anatomy.

SC The anatomy, ja. It's also like uhm like when we. I use my reference a lot so any person that you can get that you think would be best to act out that scene or is really good for it, that helps so much because you always go back to it even if you go sort of off from it. It's always a nice base like pose wise and stuff. Some people they even take like the reference and they will re time it and stuff. Like I danced this one thing that we doing now but like I was trying to choreograph it and I didn't know what I was doing so I was just trying stuff but I didn't even have the music playing so it was way too slow so I chopped. I squished it in this program and made it really fast but then it looked so cool and that's how I actually did it and it's like no and then in animation

we ended up taking it even further. There's so many aspects that come into play like especially in the beginning with animation. Like it's more, sometimes they don't even care about the timing. It's more about is the pose telling the story. They are quite pose obsessed and then timing comes in after that so it's more like the next, like step two I guess.

CJ Have you ever used a bar sheet when animating to music?

SC No.

CJ No. Do you understand how to use the bar sheet?

SC Well we probably did stuff like that at school but that was like ten years ago.

CJ So no. Okay so a bit of history. So Disney in the early days obviously the first animations were uhm the sound was added in afterwards after the animation was done and ah but then synchronised sound came in with steamboat Willie and such and uhm obviously it was a great success because then now the music and the sound and the animation worked together.

SC Worked together.

CJ But then animators and Disney thought but listen there should be an easier way to do this then just coming up with things and this one particular animator who understood timing and basic musical concepts he said okay but let's, music and animation has timing in common so let's use a metronome as like a basis for other ideas and then the musicians can know what beats to use and what tempo and the animators can work from the certain beat and so the bar sheet was invented and this is one form of a bar sheet where we then have the musical well like you would have the music bars and then in there the bars would be indicated, ah the beats would be indicated and then the animators would write down what would happen in each frame and vocals and such also be indicated on places like this and then it also works on music scores as well so while the musicians would write down the music and like thinking how to work this music, the animators would have like what happens here, he holds his pose there or he so they work together from like there's one piece of paper, a central piece so they can go forward.

SC I think that is helpful especially if say the movie is a musical, I would say stuff like that would be good to do because right now it's kind of all just left to me and it's just like go do it.

CJ Ja exactly. So then they go and it became a bit more detailed so camera angles were included and again still with the timing and such but also with the musical scores but then now these days animators who still used bar sheets moved away from having the musical music and just incorporated like the actions and the frames and well screen like what. You said you will take the screen shots, screen grabs from a reference so that's maybe something. Maybe I need to put there and exaggerate the poses or whatever and now they totally away from the musical bars, ah musical staffs and they just went to sound and such. So I am proposing that character animators need a basic musical competency, just basic musical knowledge to do a musical scene more believably and I will be demonstrating this by particularly using the ballet scene of yours and not that you did bad, you did amazing, it's just one way of explaining it.

SC Cool.

CJ So this is Swan Lake. It's the sheet music for it's a whole orchestration so this is twelve pages and I'm not proposing that you know how to read this and understand everything but then obviously Swan Lake has a main theme as most of the songs, yes and that's the da, da, da, da, da, da, dum so all we need is just the one theme. Just the one theme that will be prominent and the animators will most likely listen to when animating the scene and so I propose the animators then receive a click track along with the music, the final music so you don't have the mission of ja shame. So the final music along with the click track so you can determine the tempo if it's not given to you.

SC I would think like a click track would be super helpful because the clip I'm using right now is like a lady singing one melody and then there's like a trumpet doing another melody and then there's another beat saying underneath it and then sometimes I'm like wait which one was I following. I don't even remember.

CJ Ja. So along with that but then also they would get a piece of sheet music in the form of a bar sheet which I will explain now but then the basic musical knowledge I think well I'm proposing they should have so basic music terminology such as andante which is the tempo at which it will be played and then the mood terminology which is dolce espresso which says it's light but swiftly. Ja swiftly but expressive and which I think will help the animator if you know what the mood will be and then the dynamics because here it is soft the piano and then forte is loud so obviously the whole piece builds up toward that one point and then the animator can know okay but my movement should also build up to there.

SC It needs a build up.

CJ Ja and just know that there's a certain amount of beats in a bar so time signatures and just know that it goes up and down so if maybe if there's a higher note it will be more lighter movements whereas lower notes will have maybe a heavier feel to it and then along with the click track and the music and the whatever they will receive the sheet so I know we are living in a digital area so this will obviously and this can even maybe be digitised and then like you said you can add your frames and particular moments where it should hit the music and then write down your actions maybe describing it so that the director and the musician and the animator can work from this one central place and everyone can understand what's going on and see the whole thing in its totality because I know when we work in Maya for instance, you only see the frame line and to get everything there and know okay but that specific beat happens there, is not always the best of ideas so then you can write down your title and the tempo and work out the frames per beat and the bar. So then everything is on one sheet and I think that's all I wanted to say about this.

SC [unclear] how focused and even the one we are doing now, like whoever edited it, I don't know how musical they were but uhm they cut a lot of the music on like the sixth count or something and then if you got the character and they end on sixth then I guess they could hold like for seven or eight but then those shots are already cut and it's on something else and everyone is like that's such a weird place to cut but like it

only felt weird to me and then no one noticed and it was weird until I started animating and then it's like the dance and it just feels awkward.

CJ Ja, it's not complete.

SC It just feels awkward so like now we are having to extend and like rearrange stuff but they really didn't want to change the edit but I don't know something like just more musical may have changed the way they edited it a bit.

CJ So how do you feel about the certain competencies that I have identified as like the terminology and the things as being?

SC I think it's kind of funny because I like remember all the musical terms from school. I think it would be helpful. I just think with how most animation productions go, it's always rushed so it would have to be something that is brought in from very early on like so in the edit, rough, rough, rough edit and stuff they already got it down I guess but it would actually be kind of cool as well to sort of where the music builds and falls. Like you wouldn't have to do that exactly with the animation but it would be if you really last then it would be a nice guide because right now it's just me.

CJ Ja and the thing is maybe it can even run as a plug in in Maya and you can see the reference footage alongside the notes like I don't know if you know the music program [unclear] well uhm it writes out the notes for you but it has like this little bar that follows on like you would have karaoke and then ja. So maybe even with that and then seeing the reference footage alongside the music and what she proposes should happen.

SC Ja because also what I ended up doing is uhm with the third part of the dance that I choreographed the director really didn't like so I had to redo it but no time and I didn't have time to go to. So what I did is I took a dance that I found on the internet, blues dancers and then I took jpegs of their, my favourite poses that they did and then I literally just shifted the pictures around and shortened them and lengthened them and then I was like oh that fits really nice with the music. So even though it's not actually with the people who are doing in the clip because I chopped and changed like it worked out really well and you could see it fitted with the music and you were just reading poses. It's kind of like that plus something to just identify the music a little bit better would have been super helpful.

CJ So that's great. You can keep this. Thank you so much for your time and everything. I really appreciate it. You have been a great help.

SC So do you have to write like a theses thing now?

CJ Ja. So much work but its fun. It's really fun.

SC At least it's a fun subject.

CJ No, definitely. It could have been worse. Will you be able to, maybe show me the full because he's also said that the full scene wasn't in the film.

SC Like I can show you what they've got today but I was kind of sad when I opened it because they have cut off all my dancing scenes in the so it is missing pieces.

CJ Can you show me the original?

SC Ja, you can watch it. Oh the original.

CJ Before they cut it.

SC Okay sure.

CJ If it's possible.

SC But like the animatic or like with my actual? I will just run through it. I will show you the captures of it.

CJ Sorry this is for you to say thank you for your time.

[END OF RECORDING]

INTERVIEW 7:

Interview with **Annike Pienaar (AP)** an animator at Triggerfish Animation Studio. She was not involved in the animated feature film *Khumba*, but is currently working on Revolting Rhymes (which also includes dance scenes).

Date: 31 August 2016

Length: 26:14 Minutes

Place: Triggerfish Animation Studio, Cape Town

CJ Have you ever animated a dance scene?

AP No. I have not really animated, not dancing to music, not really.

CJ Not even a short snippet?

AP No (laughter) not even a short snippet of dancing. But technically you know, characters dance all the time.

CJ Ja, exactly, even if it's not to music. Okay if you would animate to a piece of music, what do you think the shots will be planned out in the animatic and will the animatic have sound then to show what happens?

AP That is quite a good one, sometimes especially if it is a dance one, they usually do get the music written before and plan it out in the animatic already. But on this project they didn't, they don't have the music yet, and then they just work on a beat, so like (clapping) it's on fours or whatever, and then you just have to make sure that your dance happens on the beat, so that they can just match it up to the music that's going to come later. So I think it should be in the animatic, but it's not always.

CJ If you think the musical scenes are in the animatic, how detailed do you think the drawings would be of the movements?

AP Gosh that also depends on how far they think ahead, with animatics. Some board artists are very lazy, and the director wants the artist to bring something unique to the shots, so they leave it quite ambiguous while they're drawing for us. Other directors are very specific and they have a very specific vision of what they want, and

then they'll detail that action out like I cannot believe. Like I think this one was quite detailed in the kind of movements that they wanted. Ja, I actually don't know, sounds the best to us, but I like it when it's not too detailed, because you like to, like put your own stamp, and you know, give some kind of input into the dance.

CJ Ja, creativity and all. What do you think the animator will receive that will enable them to animate the dance scene?

AP Well, you'll receive a brief which will tell then the style of the dance that you want, which is good, and then obviously the music that they want to dance to, and the characters, you know.

CJ And the rigs. So how would you personally go about using these tools to animate the dance scene, from getting briefed by the director to handing it in?

AP Cool. I'd probably start off doing a lot of research. Watching a lot of dance videos, and planning is just almost 90% of the work. It's really important, so I would check out other dances, and then I would sketch out rough thumbnails, and then I would probably pitch it to the director and we'd have a chat about it, till we've worked out the idea. And then I would go and block it out with my characters, and we'd have a chat with the director again, so that he's happy with the poses. And often things change because you realise characters can't really do what you had in mind before. And then you would explain it, and ja it's just always working with the director through every step until it gets taken away, because no-one is ever happy.

CJ Shame (Laughter) How would you work out the correct timing for the musical scene?

AP Well I think with music you can, it's – I think I would just go based on reference really, seeing what other dancers go with in videos on You Tube. And see how they follow the beat. But I do think it's cool to work with aspects of the music that stands out. You can hear in the music when it's rising or when it's going into some kind of crescendo or something, you know, and you want the dance to mirror that. And when it's quiet you kind of want it to be small and subtle, ja. And I also feel that a lot of mistakes first-timers make are having big moves the whole time, and then you have nothing small to kind of compare it to, so I would just listen to the mood of the music. It's almost like animating a piece of dialogue, right? You write it down and then you see where the accents and the voice are, and that's where you put your visual accents as well. So ja I would definitely take that into account.

CJ And what do you think will be challenging about animating a dance scene?

AP Gosh! I think that the fact that the characters are moving all the time. Doing stuff like you know, moving your weight from foot to foot, and just moving your feet in general is super challenging, and doing that rhythmically as well because a dance, your body is almost doing something unnatural, you know, and forcing that dance and then making it look cool and quirky and work for the camera... it's a nightmare? Gosh I don't know how Sam does it, but it's very – it's very challenging I think, and then ja, characters are often interacting with each other all the time is another nightmare. People touching in 3D, touching objects is just – you don't want to do it.

CJ No.

AP It's a lot of technical constraints and stuff like that, so I think it's very ... it's super challenging.

CJ More challenging than a normal animation scene?

AP Well, gosh I can't say that for sure, but to me at the moment, yes definitely.

CJ Okay and do you know of any specific method or process that animators might follow when animating to music?

AP I think each one is unique. We don't usually animate to the score basically, that's in the background. In fact we usually don't know what it is when we get our audio, it's just a dialogue, it's usually that. But I think you would, I don't know, you just listen to it and do what you think sounds, looks best with the audio, I don't know, you would get into like the mood of the music, trying to portray that in your character's mood.

CJ Ja, animation differs. Do you have any musical knowledge or skills?

AP Well yes, a little bit. I took music theory at Affies for 2 years, but didn't really – it wasn't something that I was super interested in, in terms of the technicalities of it, but I play a bunch of instruments.

CJ Namely

AP (laughter) like the only thing I don't play is base (laughter) Ja but I played the violin since I was little, and went on to like guitar and play my ukulele and got a keyboard and played drums for a while, and then I played the recorder for a little bit, and just a bunch of stuff, whatever I can get my hands on.

CJ Oh, great. Were these instruments self-taught?

AP Yes, all of them, except for the violin, I had lessons when I was little, for a long time.

CJ Do you think you have an innate musical talent or an exceptional love for music?

AP I definitely do love it, definitely love it. I don't know about talent, because no-one in my family plays anything.

CJ But the fact that you can learn so quickly and like teach yourself instruments, maybe can...

AP Maybe. Maybe a little bit. Ja. (Laughter)

CJ Do you understand basic musical concepts?

AP A little bit. Very basic.

CJ Do you know how they relate to animation?

AP Well, Gosh! I know that music is a big... timing is a big issue, timing in animation is the centre of all things, but otherwise not really. There must be some terms that you can relate to, but I think you can relate to almost anything. Well maybe I should make examples.

CJ Yes, for instance, like you said timing is important for music and in animation for us, and then tempo which is the same as pacing and such in animation, also rhythm.

AP Ja. Ja.

CJ You know, beat to the rhythm and ...

AP Ja, rhythm is a funny one, because on the one side music has like (clicking fingers) rhythm, and the mission, sometimes I felt it was almost like a handicap for me, you know, because I kept wanting to...my movements end up being very steady, you know, and rhythmic, which you almost don't want, because people don't move to a

tempo. So I kept having to break up stuff and I get a lot of notes, like even now, that my tempo is too even. Like this is too even, break it up a little bit.

CJ Mmm, through secondary animation. That makes sense. So that's basic musical concepts, and if you think about it, it's a lot of things that music actually relates to animation, I think more than we realise but ja. Did you use your musical knowledge, or rather do you think you would use your musical knowledge in animating? Specifically for a musical scene, but in animating in general as well?

AP Ja, definitely. I think my musical knowledge is quite subconscious, if that makes sense, but it is a massive part of me, and I do think like every day I subconsciously put it into my animation and use it. Especially the timing part. When I time something out, say for instance a jump or something, say someone jumps off something... over a wall, I would almost feel it. And I think that's quite a musical thing, it's like (claps rhythm) and I time it on my phone like that, and then copy that timing over into my animation. And I think that definitely comes from a musical source, of being able to feel something like that, something needs to happen. And also musical people always, quite correctly too, just tend to look at the technical side, but music is a very like a very emotional medium, if that makes sense, and I really feel like we as animators, we do tap into that to kind of express ourselves in a different way.

CJ Ja.

AP It's so cool, it's magical, it's a magical connection.

CJ It is hey? What other knowledge or skills do you think the animators need to animate?

AP Ja. Gosh, I think that's... having an understanding of your own body is, funnily enough, I always took it for granted, I didn't want to do a shitload of sports back in the day, and then I realised that a lot of the animators here actually have their own... like a lot of the guys here do Jujutsu, or Sam does a lot of ballet and running, and everyone has some kind of physical activity because it literally lets you know, like how you move, and what muscles get affected by what actions, and just how your body behaves basically. So I started getting into that as well. So I think some kind of physical activity is definitely beneficial, something people don't always know or think about. Animation obviously drawing, figure drawing, just understanding the human mass, and form, and what looks appealing. I also think photography, or any other visual thing is beneficial just to study, just visual, trying to create something visually beautiful. I'm trying to think of anything else. You know what, just, we animate everything every day, if that makes sense, people eating, sitting down, taking the train, whatever. So almost any other activity that you do could become handy at a point in time. So as an animator we're like – we get quite – we research quite a lot of other hobbies and things, because okay I have to animate someone swimming, then I get on the Internet and I research everything I can about this activity, or I try to make someone... I don't know, using a knife in a specific way to chop an onion, then I, you know, what is this you have to do, then it's like oh it's this technique. So it's super interesting, it's like we have multiple careers at the same time.

CJ At once. Have you ever used a bar sheet to animate?

AP No. I know what that is but I...

CJ Oh so you know?

AP It's quite a ... well it's quite an old-fashioned thing they used back in the Toony days, and I am one of those really hurried dirty animators that just goes with my gut feeling, and do everything really messily, and it comes out okay in the end.

CJ (Laughter) Great. Okay so yes on that note a brief history class. So Disney started as they started doing animation and then the sound was added in afterwards. And it worked, but it was not Wow! And then along came, they did Steamboat Willy with synchronised sound, and it was very successful and people loved it, and they started doing sound before or alongside the animation development. And there was this one animator specifically, Wilfred Jackson, who had a love as well, and a bit of musical knowledge and skills. And he suggested that there must be a way for animators and music to like work together, you know, and form something, and not just do this whole messily thing. And then he suggested, but we have timing in common, so what if you use the metronome as like a guide to you know, guide the musicians and the animators then?

AP Yes.

CJ And that's where the bar sheet came in where they had the steady beats and stuff.

AP It is, it is to be clever, it's the same way that you synch your own music to an image.

CJ Yes, so they had like the set bars with the counted beats, and those....

AP Ja, you could see on which spots a word would hit basically, and then that's in your timeline. Oh that's an old-fashioned way to do it, I don't know how they animated back in the day.

CJ Ja it was.

AP Now you can see it and you can hear it and as you scrub it up, it's there.

CJ It's there yes, exactly. So then they obviously did it on music paper as well, like this is an example where the musicians still you know, writing down the music and then they're writing down the actions and what could happen.

AP Yes I know, that's crazy. Pioneers.

CJ Ja. (laughter) And then it went on to more formal, a way like this of writing the music down here and more actions, camera based and timing obviously, but still with the bars and set tempo and such. And these days what we see animators still using bar sheets, use something more like this, where they have those ...

AP Frame nails ja.

CJ Frame nails and thumb nails of what they think should happen in each frame, and then the action, and then the music bar is still there but not really the music. But then today they don't use the music bar any more, they just have the set amount of like bars, and then a tempo and then they worked according to this. Okay, now I proposed that animators should have, especially for character animating, and dance scenes, should have just a basic musical knowledge, and I'm going to demonstrate it to you just by showing you a, especially talking about the scene, you've probably seen Khumba, where…

AP The ostrich?

CJ Did the ballet scene yes. Specifically taking Swanlake as an example. So this is Swanlake's orchestration, and it's 12 pages long, and I do not propose that you know this. (Laughter) It is very busy and most animators will look at this and faint.

AP Yes.

CJ So all musicians would look at it and think twice, because we really understand what that is.

AP Yes, I think... Holy Nuts!

CJ Ja, it's crazy. So basically what you just need is well I think we as animators listen to music and we also try to find the main theme, and then work according to that. So the main theme of Swanlake is that (singing) and I just propose that you have, instead of that 12 sheets of music, you just have this one sheet, with the main theme, and all the visual that you know, a musician would need to play this piece successfully.

AP Yes.

CJ So within that, I propose that animators should know of basic terminology, music terminology, such as relating to tempo, like the Andante and those type of things, obviously we can Google it also, but it's so easy to know, okay the Andante is moderate speed, then you can know like how what the theme – and also you'll be able to hear it in the audio clip as well, but then to see it visually maybe just reinforces it.

AP Ja, I think it just makes you aware of it at least. Or if you could have a talk before with the director, it might help you, if you both know the terminology, to communicate more clearly what you need.

CJ Ja, that's actually a good idea. Like you said mood is also very important, so I'm suggesting also a basic terminology of mood, like Dolce Espresso, which means swiftly but still expressive, which actually sums up this piece very nicely. And then dynamics, knowing when, like here for instance you won't have a big movement, because it's like still piano, and then you can still see by looking at the visual, like in the sheet music, that it builds up to this big forte, so that will be the climax of your dance also maybe.

AP That's true. What I want to say, so on the one side we've got someone who does know all this, what the words mean basically, but if you just closed your eyes and listened to the music a couple of hundred times, you'd pick that up without the knowledge, I think. You would know or you would hear that the music is more quiet, or smaller in the beginning, and that it does build up to a crescendo in the end. I mean I think inertly, and instinctively you would, if you're a good animator, you would put that through in your animation, and make it small in the beginning and bigger in the end. To me, I don't know, terminology, that's probably why I fought it so in my first two years quite a lot, is because (laughter) to me it's a little bit, like I might be like offending millions of people, and Bach is turning around in his grave right now, but trying to... music is something that we hear, right? Through our ears, and we feel it in our souls. This is just a way to communicate it on paper, if that makes sense, or to put it into words. I think that to me it was always silly that we write down music almost. It's like, music isn't something you write, it's something you listen to! (Laughter) But I understand, it's like reading a book and telling someone a story, you know, it's just text, it's a language basically.

CJ Ja and also, aren't we as animators telling, like portraying music by writing it down?

AP We are, but that's why I'm saying, to know the terminology is to write it down, you know, on paper, if that makes sense. But we can take what we hear and put it forward in animation through the computer. Basically using animation instead of paper to communicate our idea, if that makes sense.

CJ Ja.

AP So instead of from hearing it, going to writing it down, you go from hearing it (whispering) ja if that makes sense.

CJ But I think then also I know I have to plan a lot, and I think like also Samantha was doing today...

AP Definitely planning.

CJ Like the director wants to see where you are, what do you want to do, like he is saying, planning out the – writing the things, and that is why I am suggesting this maybe as a part of the planning process you know, for ...

AP You'd definitely think that if the director and the artist have an understanding of musical knowledge, yes, to communicate more clearly, definitely. Definitely.

CJ Ja, because then I would propose that the character animator will then receive this bar sheet, within the music already like tied up in these bars. Then obviously the audio track which is very important, and then the... maybe a key track over the audio track, which indicates the steady beats.

AP Yes, the clicks I think is the thing that stands out the most to me, as the most beneficial part, because the director can easily set on the fourth click, or on the fourth beat, and then they both know exactly.

CJ Know exactly where they are.

AP Instead of, on that (laughter) But we do use like a timeline, which can serve a similar purpose, so and that's also because the timeline is as specific as you can get the – twenty five frames on one second, on frame 142, and then you both also know where that is.

CJ Ja, exactly. The reason I'm proposing that it should be on one sheet for instance is I've noticed, I've read a lot that and the reason why some animators still use bar sheets, is because of the timeline being this long and...

AP Ja, linear thing.

CJ Linear thing, and here you can see basically the whole piece of music summed up in one page.

AP Ja.

CJ So it's much more, you can see where it builds up to where it like in one page so...

AP That's the truth, definitely. That's a good one.

CJ Ja, and like so you would use it here for like inserting your initial sketches, or like main poses so that the director can see where you're working towards. You can write down actions and change it, and I don't suggest that we only use it on paper, it will maybe be able to be a digital thing.

AP Yeah, probably.

CJ So they can be updated by the musicians when they have like musical...

AP I think the digital's probably better. Because often times especially we work with overseas directors and things like that.

CJ Exactly. So being able to show it to them and working for you as a reference, maybe it can even be like a Maya Plug In, where it would be like at the bottom of the timeline, where you see the music...

AP Ja, the sheets.

CJ ... and an audio, you can hear it as well, and then like I suggested, maybe where you can see, if you can see that visual reference that you've shot. I know we work a lot from visual references. So if you can see that along and then maybe time it with the musician... musical beats and audio...

AP Yeah.

CJ I suggest that's maybe more a correct or efficient way.

AP Ja, I think especially having the visuals as well, underneath in the timeline or... that would be great, I like that, but I also like the fact that it's all on one page, often times we've got too many little bits and pieces...

CJ Ja, papers lying around.

AP And it just stretches forever and just...

CJ Ja, exactly.

AP It's very good, summarising on one page, awesome.

CJ Ja. So yes that's the idea

AP I think it's a good idea, ja, I think you're onto something here, definitely. Ja, communication-wise, that's still a long stretch, I mean we're struggling to communicate in English with these guys. They're German, so just like their understanding of the word bouncy and our understanding of the word bouncy is not the same (Laughter).

CJ Not the same, ja.

AP But maybe having clear terms like this, like saying you know, it's basically like a Dolce Espresso, if you do know what that means, because it's kind of universal, it makes sense.

CJ A universal language, ja.

AP So that might even help bridge this kind of language barrier, having this kind of knowledge of music, yeah.

CJ Ja, well that's the suggestion.

AP I think go for it.

CJ Great. Thank you. Thank you very much. I just sounded like Elvis (laughter)

AP Thanks a lot.

CJ Thank you for your time.

AP I'll have a look at this, maybe it will help me out.

CJ Ja, maybe it will, for future references, if I get Auto Desk to work.

[END OF RECORDING]

INTERVIEW 8:

Interview with **Paul Lombard (PL),** senior artist at RetroEpic Software, who was an intern animator who worked on the animation feature film *Khumba*.

Date: 1 September 2016

Length: 36:01 Minutes

Place: RetroEpic Software, Cape Town

CJ What were your responsibilities in Khumba?

PL So I started on Khumba as an intern. I came in and I started doing previs. So I don't know if you know what previs is but it's very much like just setting up the shots, putting characters into scenes, saving the files out, making sure all the characters are in there and if required if it hasn't been done like camera movements, very rough placements and like just framing of characters inside the movie. So it makes the process much easier when animation starts that people just open up a scene and stuff is there for them to start animating. So it's the very first part of the animation part where you can start seeing framing, something for the edit to actually see, the movie is moving along the way it should be. So I started doing it. What were my responsibilities after that? Then I started doing character animation so I started doing, you know like we didn't have enough, there's not enough time and not enough people to have control over one character for the whole movie and that's I think ideal to get consistency in a personality for a character and the same guy and you know the person inside out or the character inside out and you can almost, it's almost like an acting thing. You become that character and you know the things he or she would do so there's not enough people for that so what you do is you just do everything basically. You get control over everything which is quite fun. It's fun to animate different personalities and you know get control over the shot. So I did like quite a bit of animation. I mean like I think the other day I made a reel and it was like over three minutes of animation that I did which was really cool.

CJ What particular characters did you work on?

PL I worked on Khumba. I worked on the springbok scene so a lot of springboks. I worked on some of the mud fight so a lot of zebra animation. I did one of the shots for when the leopard has a flashback; he gets kicked as a little cub. He gets kicked into the water so I did that shot which is quite cool. I think that's it and Scalk the wild dog so I did some of the wild dog scene, which is quite cool.

CJ Did you animate any musical scenes?

PL Ah no.

CJ And have you ever animated a musical scene before or recently?

PL No.

CJ Okay. Do you know if they if one would animate to music or do a musical scene, do you think music will be incorporated into the animatic?

PL Ah absolutely. If there's very strong tie in to what the musical beat is then you have to know what the music or the tie in of the beat is to animate accordingly. Unless you know at least the time signature of the piece, you don't have to have the exact music but you have to know what the kind of beat is going to be to animate accordingly because then at least like if some composer is going to come along then you can just compose to a certain beat and know it's going to fit the animation regardless but without that you could be animating like an eight, eight or something and then he comes in with something else and it's not going to fit.

CJ Do you think that the scenes would be in the animatic, the particular dance scenes would be very detailed like detailed drawn out like there the character starts to prepare himself for a move and then turns around three times?

PL No. I don't think so. I think what you need for animatic and dancing like even not particular for music scenes but like for the whole story telling, you don't need to have the whole thing detailed out animatically. What you need is your key poses and that's not a detailed thing. It's just the poses that are going to show what the story is about and I think that holds true even for like a musical scene. You don't need every beat of the shot down. You need just the key poses to tell the story and you know like the double steps that he's going to do on the dance beat or something is going to be filled in later.

CJ Ja, animated in. Okay. What do you think what you need as an animator to animate a dance scene from the brief to the handing in?

PL Probably reference. Like I would need to get some like sometimes you can wing it but I think for dancing because I'm not a dancer and I don't know very much about dancing I would have to collect a lot of reference depending on what kind of shot or what kind of person it is. So like a lot of dancing reference to see where the center of gravity is or even what the movement is. Dancing is complex. There are strange things that they do that you can't just make up.

CJ Don't you think you will need like the music or like you said maybe just the steady beat or such?

PL Yes. Yes. You would need to know as I say like the time signature or like the beat of what's going to happen so you can animate to that but like I think it probably would help a lot to have the actual music because then you can do much finer correlations to the music. You know like if the thing is going fast or something then you can start animating in a way that is in line with the music and not just like a steady you know beat that you always doing something to. So you can actually much more closely integrate your animation with the music.

CJ Really. Okay. How would you go about? Like explain your process? How would you take all the information you gathered and then go about animation?

PL Well my process now is very much like something I learnt when I started Khumba. I watched this series by an animator called Keith Lango. Have you heard about this guy?

CJ Mm mm.

PL He has a very good series on teaching animation so if you want to learn even more then I highly recommend this guy; Keith Lango series on how to animate and what he does is he teaches you how. Animation is quite in depth. There's a lot of things to think about the whole time. There's twelve principals that you like, you try to think about it all the time but you don't right. So he very easily like breaks it down into what you should be doing. One of the things is like to do step keys right. So you are animating every frame right next to each other but only the key poses for the whole story. So you are not worrying about the timing or limbs in-between each other. All you are thinking about at that point is poses that tell the story and that's I think for a dance routine [unclear] I would still work out like where the character is going to be in 3D space in that short you know next or the first ten frames or twenty frames or however long the shot is. Like just stack all the keys right next to each other and make sure I have the positions of the story that I want to have the character in and then do timing and everything like separate. Like a layered pass of like strong key poses and then timing that out into like the whole shot length and then only after that doing breakdowns and easing them out and easing them out. So it's a very nice way to think about it because it makes you have to think about less things and it comes out stronger at the end.

CJ Do you think you will listen to the music as a reference while animation is in progress?

PL Yes. I think after the key poses have been nailed down, what you do then is listening to the music and like think about you know the intensity of the piece that you are listening to in that shot and then you can adjust your poses accordingly. If it's a quieter moment or a stronger moment, it's more intense then. I mean to put all the patterns into your posing. If it's a charismatic person, he's not going to stand or dance the same way, as you know someone who is not.

CJ It makes sense. How would you determine the correct timing of the music?

PL The correct timing. In what way?

CJ When you work out the beats per frame by using the tempo and then like working that out or will you listen to the music, alongside some reference and then work out oh there's going to be that or that certain frame and then time wise like that.

PL Ja like probably. I mean like all the shots I did for Khumba I did reference and like it does help to do it but not really. We didn't have the music so I mean as I say I have never really animated a musical piece but I can imagine if I did I would listen to the beat and find out what the tempo is and make sure that he's obviously like stepping or moving in a way that is according to the time. So working out the timing of that. Uhm I mean it's going to be very regular in your timing.

CJ Okay. Would you say or what would you say would be challenging about animating a dance scene?

PL I mean I think making it feel still believable. I think keeping your sense of gravity believable while you are moving is quite tough. Any physicality movement if it doesn't very quickly feel like the character is supposed to fall over because with dancing you moving around a lot so you have to make sure that the character is not supposed to fall over you know.

CJ Ja keeping that sense of believability.

PL Yeah.

CJ And would you say it's harder to animate dancing animals versus dancing humans?

PL I think it would probably be easier because one reason is you don't see dancing animals so there's a sense of like you know you see people dancing, you know what that looks like. You know what a two legged figure dances like. You've seen many shows or you've seen many movies where people are dancing so you have a mental image of what dancing looks like of a two legged person but for a four legged person I mean people are not going to say ah they've seen a four legged animal dance very often. Maybe they have like an image of a springbok doing some hopping or something but it's not like a ballet dance. It's not a waltz. You know you don't have an image of what a springbok waltzing looks like. So I think there's a sense of, what's it called like space to…

CJ Interpret or imagine.

PL Ja to imagine it. People are going to criticise that less I think then criticise the human dancing or the two legged dancing. So I think it's probably like not technically easier because there's still like the four legs of the animals but uhm the believability of it is probably going to be easier for the four-legged animal than the human.

CJ Do you know of any specific method or process that animators might follow when animating to music?

PL As I say like my only animation experience was on Khumba and I didn't really animate any movie or musical scene there and I haven't worked in a big studio where music was super important so I would say no.

CJ Do you have any musical knowledge or skills?

PL I do. I play guitar. When I was in High school I did Grade two classical so I did classical guitar music and even when I was in primary school I started learning piano and then faded off but I do have musical knowledge. I play guitar on and off but I don't know if that counts as being a muser.

CJ Ja. You have musical knowledge so that counts. Would you say you have an innate musical talent or an exceptional love for music?

PL Ah innate musical talent. I don't believe in the word talent. I think people. You know I'm a very firm believer in hard work and like if people spend enough time they just get good and then people are like ah you are so talented but it's like you know the person just works hard. They do the work. They sit down and they learn and some

people learn easier like in different ways right and they find the path to learn in that particular skill faster than others. So they might have tried the right thing first. When there's like five things or five ways to learn something and you've chosen and you just going to go through the motion and do one, two, three, four, five and your way of learning is number one like you going to get it a lot easier whereas someone who is number five, it's going to take them a few tries before they find the rhythm of their limbs. So I think I wouldn't say I have an innate talent but I think the opportunities in my life experiences of being interested in music and having done music feel like I know maybe a little more than say an animator who doesn't know anything about music.

CJ And would you say you have a love for music?

PL I wouldn't say a love as a love for gaming or animation in general. Like music is great but I wouldn't say I love it as strongly as animation or like character, film or acting. I would say music. These are very difficult questions.

CJ Sorry [laughing].

PL It is. No I like, I do love music but it's not like you know my number one.

CJ Okay and do you understand basic musical concepts and how the relate to animation?

PL Ah in what way would you say that they relate to animation?

CJ Well for instance musical timing and animation timing is obviously a very important, critical thing. So musical timing is the same as performance timing and also tempo and well you work out the tempo and beats per minute and you have to like I say when animating a musical scene you have to have that tempo or like the time signature to know what happens when and then rhythm which is frames per beat that you work how many frames of the animation will be in one beat and so basically just these concepts I don't think we think about them a lot but that relates to animation.

PL Absolutely. I totally agree but I think the one thing that would stand above all of those for me is the phrasing of how the instrument is being played or the voices being you know delivered. Like the phrasing for me in acting and like animation, all that stuff is like above the beat. You know like. I think it definitely helps.

CJ Yes. I do too. Do you think you subconsciously or consciously use your musical knowledge to animate?

PL Absolutely.

CJ Can you elaborate?

PL Well if it's unconscious then there's no way for me to say how it's working. If I just think about it consciously if I'm laying out as I say before the stacked keys in the beginning just to do acting choices and then go onto a timing phase of animation. When I'm putting those keys apart to do timing there's like I want to say innate abilities to understand like a timing of an action. I think that's where it would come into effect being able to be like ah this thing is happening with this and then I'm going to do an offbeat where this is like a surprise you know. So I think.

CJ Feeling it.

PL Ja a definite feeling first.

CJ What other skills would you say animators might need to animate a musical scene?

PL Act like depending on what type of animation you doing. At the moment I'm doing a lot of game animation which doesn't require a lot of acting skills, more like sheer pose like clarity of poses is more important then your acting. You not giving a subtle acting performance in a game or a lot of the games I have been making. There are games that you do subtle acting but not as much so as maybe a film. In a film it is very, very strong correlation between your acting and performance of the character and your animation. That is all one thing. Uhm but ja.

CJ Have you ever used a bar sheet?

PL A bar sheet. Never.

CJ Do you understand how animation was done in earlier days?

PL Uhm like with tiny bit. By using bar sheets?

CJ Yes exactly. So in early Disney days music was only added on after the animation was done and along came synchronised sound with Steamboat Willy and that really worked very nicely and the audience you know really engaged with the the piece of animation. So Disney decided to do sound but before or even develop it alongside animation.

PL Together.

CJ Yes. But then animators thought there has to be a way to do it easier so that we don't have to constantly. It was a battle to do it alongside the musicians and then this one particular animator, Wilfred Jackson had a basic musical knowledge and knew the beat and the tempo and whatever and he said that maybe we can use the metronome because music uses timing and animation does. So then they developed a bar sheet which indicated set beats of the tempo and then the animators worked together to develop. So this is one form of your bar sheets where we would have like in sheet music and different bars and then the set beats would be indicated on this and then the animators would write down what happens where and if they are vocal on some.

PL Yes. I remember trying to use one of these in college. The one that I saw was a vertical layout.

CJ Oh ja that's an exposure sheet.

PL That was very difficult to read basically but I think this horizontal one seems a lot more intuitive. Mostly because software is also laid out horizontally, the ex sheet and your timeline is all horizontal and not being able to, not having to transpose into a vertical layout is probably advantageous to animate with it.

CJ I think maybe because of the screen also is horizontal.

PL Ja.

CJ So this is one of the example where the musicians were still writing down the music and animators were trying to figure out where and what would happen and changes were made on one central place and then animators and.

PL Is this a legit like old?

CJ This is a legit old school.

PL Wow.

CJ Ja so even done our music sheets but then it got the more formal layout where music was still indicated. You can see the music is quite complicated and then the actions and everything was written out, camera movements on one piece. So maybe we would have one or two of these sheets depending on how long the theme will be.

PL So like I just say part of why I think this worked back then is because they didn't have the technology we have today right. So they didn't have the luxury of previewing animation in real time just in your scene as you are trying to do it. They had to like put it in into like in front of the camera and do the cell, which is like a long process you know. It takes a while to get it like and look at your animation and like you not going to roll for three or four pages and get a sense of your whole shot with your music. I think today with computer technology being able to run music and your previews or your animatic or your very rough animation at the same time as your music is far more advantageous and being able to figure out your beats or your phrasing or your acting choices, far easier then what they had back then. So I'm not sure in my opinion that working with like an x sheet or one of these music sheets is more advantageous or not to then just looking straight up against you know music with your rough animation because it's not abstracted into another thing.

CJ Yes. I understand what you are saying.

PL It's not abstracted into musical notes and a staff and words on a page. It is literally the thing you going to finally see and the thing you are going to hear you know.

CJ Ja I see what you mean.

PL So ja but it is really interesting that I mean that process happened and they still got such good quality things out of it. It was a really amazing step.

CJ Step towards and then we continued on. Animators still use bar sheets today and kind of fell away from using music alongside the shots. They added like frames where they can see what like drawn up frames like planning you will do the key poses and they added like this and you will see it alongside the beats, look how many frames there are and such but then today now mostly you don't see any music, musical bars anymore. They just use it to time out the framings and such. So what I propose is that uhm character animators should have, especially character animators should have a basic musical knowledge and by basic I mean very basic like you don't need to understand this very intense orgestration of a piece of music. I'm just going to demonstrate this by using Swan Lake especially the Bradley scene. Samantha did the animation for the ballet scene of Bradley.

PL Yes. Yes.

CJ So for instance okay this is Swan Lake and it's the orchestration of Swan Lake and I think a lot of animators will be quite intimidating when they see this so I don't propose that we will be able to know what's going on here in any way. So what you know of Swan Lake is it has a main theme which is prominent in most songs and I think as animators we listen to the main theme to interpret how the music sounds and what we will do on a particular beat. So the Swan Lake theme is duh duh duh duh duh duh. So I propose we just have from twelve pages one page which is the music sheet, just the main theme. So alongside with this music sheet, the animators will receive the score, the audio track or a temp track, which sounds very similar or then, and then a click track, which will be over, which indicates the metronome beat, set beats on the score. So with this, the reason I propose they know just basic musical terminology or concepts is I think you can analyse it because of music, not only audibly but visually as well and I know when you analyse a piece of music you will write down oh okay at this minute this is happening and the high point is there at 2.56 seconds and then you will work towards that when animating but in here you can see everything on one page. So you will know terminology such as andante, which just says the speed of it, which you will be able to hear as well. It's quite a slow tempo and moderately slow and then the dolce espresso tells you what type of mood it is so this is swiftly but expressive and then this is dynamics, the dynamic signs which obviously it starts very softly but it builds up to towards there. So there you can see you have to build up your animation to that as well and uhm ja basically maybe like you said maybe knowing that uhm it should be lighter and you should have lighter animation. To just be able to know that these notes are higher than lower notes and you will maybe not have all the sadder scenes on such light notes where you will have them maybe on darker and lower tones and such. So just basically knowing and then obviously times, time signatures and just knowing there's four beats in a bar and then you know working out the frames per beat such as that. So with this animators will then receive it on this or will be able to have it on this piece of paper and then you can like put in your frames and your main poses for instance where you want it and then write down the actions and such. I think this is also important part for when you first starting like a planning phase of the animating thing and I don't know, maybe to show the director and so that you and maybe even the musician can work together and see how everything is laid out and planned because I know as animators we have a lot of different books with notes everywhere and to kind of explain what we are working towards is quite a difficult process. So that's why I'm proposing that you use this type of layout. I am well aware. Oh the reason is because it's everything on one page and for instance you can have a whole musical scene summed up in one page instead of having it on a, I know. We have timelines in like Maya for instance but it's very long and you don't see. You have to work, like you said it's also more easy to work on a horizontal layout then a vertical layout and I'm well aware that we in a digital age and technology is changing daily so this will maybe even run as a plug in along side it. Maybe have above the timeline you will have the musical score or the musical where you will be able to insert these frames or then have scene alongside reference footage because I know a lot of dances like to shoot their reference footage alongside the music to then use it and analyse it accordingly.

PL Okay. So I have some questions.

CJ Go please.

PL What do you think the benefit to that is compared to just having the music and understanding the music audibly like with just your ear like you getting reference for the dance if it's a musical scene and you have to do a dance for instance, you getting reference visually from dancing or from like dancers and what kind of moves they do and you getting the reference audibly from the piece of music. I mean like what is the advantage to like seeing you know the time signature being four-four against just hearing a beat? It's not like explicit saying oh this is a four-four time and I feel like even if you do see it as four-four what might end up happening is you getting a very even and stale performance you know because it's very even whereas if you are just doing hearing then your like it's not the main thing. The acting is you know things don't happen always like this you know and even in a dance and maybe like as I say I'm not a dancer so I don't. This is now a blurry area of opinion. There just seems to be a better reason to hear then to see the music because music is an audio.

CJ The reason I suggest is you hear the music along with see it visually is if you activate in a more. If you activate more than one sense especially while learning or doing something, you can understand something deeper and maybe that will enable the character animator to just by understanding it as well. I know as a musician it's more natural for us to understand and hear where the crescendos are and such but someone who maybe doesn't understand music that well won't be able to understand that and when he sees it and he just knows oh that's softly and it's working towards that, maybe it will help them. So do you agree with that?

PL I agree with that. I do agree. I think like maybe it is because I have musical history and I have like an ear. I want to say like an ear for timing and for crescendo and you know softer, quieter pieces of music like tenderness. Like I feel like maybe someone who hasn't had the musical experience then maybe it does help to see oh this is supposed to be a tender thing. Maybe when they are listening to a piece of music they can't tell the difference between a tender moment and just a regular moment.

CJ That does happen. People. Do you think a plug in for Maya would work for instance or how would you personally implement it?

PL Uhm I would yeah I think a plug in that would go above the timeline would work really nicely because that's. I mean this is again workflow dependent on people. Animators will work very differently from each other. Some people will animate slowly in a timeline and some people will animate like only in their ex sheets. There very different methodologies of getting to the end of your animation. Some people just work straight ahead. Some people layer animation with all their timing out right from the get go you know. It's very difficult to say. You would have to cater maybe for one of these things or like have a way to cater for all the things or maybe have a separate window that is also just happening on time because everything is happening in a time but it also just moves in the same way as a timeline actually does.

CJ Okay. Thank you very much for your insights. Really helpful.

PL I hope I was at least a little bit helpful.

CJ No you were. Thank you so much. Thank you for taking the time out of your day.

[END OF RECORDING]

INTERVIEW 9:

Interview with **Harold Courchay (HC),** Owner of Sabre Visuals, who was a character animator who worked on the animation feature film *Khumba*.

Date: 6 September 2016

Length: 27:49 Minutes

Place: Sabre Visuals, Johannesburg

CJ What were your responsibilities in Khumba?

HC In Khumba I was a character animator. I started off in the rigging department first until animation began and then I moved over to animation, character animation.

CJ What particular characters did you work on?

HC Khumba for a bit... I worked with Khumba and mostly with the zebras really. Ja, I didn't get a chance to work much with the others, it was mostly just the zebras. Ja, the zebras and the wild dogs, quite a few.

CJ Did you choose to animate particular scenes or were they assigned to you?

HC They were mostly assigned to us. But within the team we decided between ourselves as far as I remember, so we'd get a scene, hand it out as a team, we'd be like a team of three or four, and between the team we'd divide it up between ourselves.

CJ And were they handed over by the director?

HC Yes, handed over by the director.

CJ Okay. And did you animate a dance scene in Khumba?

HC No I did not.

CJ And have you ever animated a dance scene in general?

HC I have, a couple for adverts.

CJ Can you please describe them?

HC Describe them, well which ones? There was a dancing one, not so long ago for Ola it's a dancing ice-cream, so yeah, they gave us the music, the voice-over and we had to sort of like pole dancing. So we had to make this little ice-cream somehow, which is like a little ice-cream sandwich, somehow try to make it look sexy and (laughter) it didn't have arms and legs, so it was a bit complicated but ja.

CJ Okay and in your planning phases, were you working from an animatic when you were planning those dance scenes?

HC Ja, most of the time we work from animatic. Well we get the storyboard mostly from the agency, sometimes we do it ourselves, but most often at the moment it comes from the agency, and then what we do is, we do like a first layer of animation which is really rough, just to go with the timing, and for them to sometimes just do like a rough voice over. And then from there we get that approved, so it improves the

timing, the camera, and more or less what the character's going to do, and then we start polishing, and send the polished version through.

CJ Okay, so how detailed would you say were the musical scenes specifically in the animatic or the storyboards?

HC Really kind of rough, because it's always going to come back with quite a bit of changes, mostly to get the timing of the shots, individual shots right, and then the camera framing. So in terms of character performance it will be really rough. It will be like a few key poses, just to show more or less what he's going to do at what time, and that's about it.

CJ Makes sense. Did you refer back to your animatic when animating like, the dance scenes?

HC I do, sometimes I just go back from that same file, so I've always got it in, and I just build, or normally when I do use an animatic, I try and do it so that it's just going to be usable in the future and not just a completely separate file. I'll try and lay five key poses or... I mean, I say five, but either I think the scene would need to get to a point where the agency or whoever, the director, can understand what's happening, and from there onwards I can go back into the scene and start polishing, cutting down, and key frames. So I never try and do it completely as an independent thing. It has to serve me later. For example, for Khumba it was mostly separate files, with separate like morals and you know, everything was a lot more rough. And pretty much the only thing we'd take from that was the set and the camera, and then rebuild from there onwards. But in advertising, the way I do things nowadays, I just don't have time to do that. I have to make sure that if I'm doing something, it's going to have to be able to be used later, it's not only this time.

CJ What did you receive that enabled you to do the music scenes, like the music you said you'd received, was it a final track or was it just a temp track or...?

HC To be honest, for example the Ola one, as far as I know, I just got the voice over, never had any music, so it was sort of, they were going to do the music to the animation. It would have probably been lots better to get the music up ahead so I could get a bit of feel for the tempo, and you know, like, when to do key actions according to what the music, or the music's rating at the time, but ja, no I must be honest that often I will just get voice over and then the audio will be done afterwards. It's more up to their imagination and then they will compile a track to it.

CJ Ja. Can you explain for me your process from getting the scene, from the director, telling you, you should animate the scene, until you hand it in to them? Like in detail, how would you go about animating, the blocking out and especially of the musical scenes?

HC Okay. Well normally from the storyboard we usually write a few lines explaining what the intention is, what the character's goal is like, to achieve and portray in that scene, and then from there we'll start blocking out, or maybe sometimes get reference, for example this needs to be pole dancing which is sexy, or obviously go find reference on line if it's... and try and you know, follow what real life dancers would do, or go from there. So obviously we will pretty much keep... we'll start with the timing, so first the camera and the timing, a few key poses, from there we'll start polishing a little bit, and then send it again, and then on the final one we'll send, or really polish once they're happy with what the action's going to be, we'll go and add all the little details, and send it through again. Hopefully it'll get approved from there and ja.

CJ Ja and that works. Is that just this Ola advertisement, was it in 3D?

HC Ja.

CJ What programme did you use to animate?

HC Cinema 4D.

CJ Cinema 4D, so no Maya?

HC For that one, no Maya, no.

CJ Okay. If you'd received the music beforehand, like you said you do. How would you go about to listen to the music and then like analyse it to...?

HC Okay so listen to the music, because I reckon you've got your camera, you've got your timing, the music you can hear it as you're busy animating, that scrolls to your timeline, so you know exactly when to hit a certain pose according to... that actually makes things a lot easier I think, because in terms of tempo, you know exactly what you're doing. You listen to the music and you're like, well, this is according to what the music's playing, you think the character should do certain moves, and that will just, it will feel right, compared to just trying to imagine it in your head and saying well hopefully the sound guy will think okay like cool, when she does a little spin, it will be nice to have a little tempo kick.

CJ Ja.

HC I actually did another dance scene, I think.. it was quite... but it's... let me just see if I can trace my emails... what was this for, this was for Albany ja, a little dancing toast.

CJ Cute.

HC So the little toast was, it was a girl and a guy, and the guy was like sort of break-dancing, and the girl was like very classical...

CJ Ja, ballet dancing.

HC Let me see if I can trace this. Okay you can just ask other questions, I'll look for it.

CJ Okay. Do you think it's more challenging to animate a dance scene than a normal scene, like let me say it that way?

HC No it depends on what he's doing. If your character is running, jumping over obstacles and doing a back flip at the same time while he's grabbing objects, throwing them, then obviously it's a very complicated scene. But overall dance scenes are a challenge yes.

CJ Why do you think they're challenging?

HC It's just the timing, it's really hard to get the timing right, the posing perfect, the blending between positions, it's something that humans are sort of used to looking at, and you can really – you can sense straight away when the weight, the timing, the tempo's not right, so it's something that's easy to get wrong I think, and I think that's what makes it difficult.

CJ Oh, and do you think it's harder to animate dancing humans than animals or like ice-creams and toast?

HC Ja I mean like ice-cream with no arms and legs is always a challenge, because you can't do such pretty poses, but it's a lot simpler character to animate. Well the character with very long legs, or very long arms, you know it's obviously going to be a lot more complicated.

CJ Ja. Do you know of any specific method that animators might use to animate to music?

HC To animate to music? In what way, like...?

CJ In like a specific technique, or something they use

HC Every animator animates differently. Some will do what we call stepped key, where there's no planning between poses at first, it's just between stills and stills, then you're doing your timing through there. Some will go and just key as they go. So it's... in terms of technique it's whatever works for you sort of thing. But I'm trying to do it with sound, I don't know, I'm just, that can help you time it out, and reference. I mean that's the main thing.

CJ Ja. Do you have any musical knowledge or skills?

HC Very little, I play a little bit of drums, that's as far as it goes.

CJ Was it self-taught?

HC No, I did have some training.

CJ Can you still play drums?(Laughter)

HC I still play drums, actually I used to play saxophone as a child and used to go to Conservatory, but all that knowledge is long gone.

CJ Do you think you have an innate musical talent or an exceptional love for music?

HC I like music obviously, who doesn't? I don't say that I can live by it, I listen to music, and in terms of specific musical talent? No. I don't think... I don't think it's there.

CJ Do you understand basic musical concepts and how they relate to animation?

HC Ja, I know when a track's going to work, or something like that. I've got like a sense of what's good and what's not. I mean now that it comes to the technical side, I know that I had to learn that as a child, I can't remember any of those.

CJ So some terms that I want to point out to you that relate to animation that we don't always think about is like timing, obviously timing in musical is critical, as well as in animation. And then tempo, you know, which is the same as pacing in animation and making it go faster or slower, and rhythm, which relates to time and then we can work out the rhythm through beats per frame and such. So that's, ja there's a lot of concepts that we use in animation that I think are very musical, important musical concepts as well. Do you think that you at all used your musical knowledge to animate in general? Well musical scenes as well as just normal?

HC Well I don't know how I would use my musical knowledge to animate. I animate to what the scene needs and what I'm given to work with. In terms of, as I said I don't have much knowledge of music, so I don't know what terms I'm using, maybe I am using it but I don't know.

CJ Ja like subconsciously then.

HC Ja, normally I've got the track and it needs to be this kind of movement and this is the right time I've got it, and when the music ends at this point, or this kind of tempo changes, I know my movements have got to change accordingly, and that's pretty much as far as my music knowledge will go.

CJ Ja. But don't you think, I mean a drum has a lot of timing and such, don't you think that that might have helped you in your animating? Even subconsciously, like I don't think it's from you trying to consciously think about that.

HC Possibly, but I'm not trying to keep a rhythm as I'm animating, I'm testing, checking it out, seeing it's not working, move stuff around, try again, you know, it's a process you're doing straight away with a tempo, it's like a try, fail, fix up, try again, polish all the time. You know, it's a long process, it's not like something you're quickly doing on the spot, and which you've got to have that trying to keep a beat or something, so...

CJ Ja, ja. Okay, and if not musical skills, what other skills do you think an animator might benefit from when animating?

HC Well definitely drawing. The better you draw, the better I think it is for you, because to draw out your poses for animating, something I don't do so well, but I can definitely see the use for that. Drawing, ja, good eye, for I mean research as well, and also taking the time to plan it out, if you're doing a massive thing, or just going along and getting stuck in, the longer you plan I think the better the line mats afterwards.

CJ So planning is important. Have you ever seen or have you ever used a bar sheet to animate?

HC Bar sheets? In 3D animation, I mean the bar sheet is pretty much a timeline now in the 3D software. And you've got the dope sheets in there directly to move stuff around. I mean the bar sheet no, you're not going to, I mean in 3D you're not often going to plan – I mean the big houses maybe do it, but as far as I'm concerned, I don't think it's going to be used very often here. I'm assuming the bar sheet's the dope sheet?

CJ Yes a bar sheet so okay in early Disney they used like a bar (laughter)

HC Oh where you learn how to time?

CJ Yes, so in terms of Disney, in early Disney days, you probably might know this, then the music was done after animation, which was not ideal because the animators had to have something to which they work. Then along came synchronised sound with Steamboat Billy, and it was a great hit, and the music synchronising to the performance was just something the audience had never seen before. But then Disney and the animators thought that there must be an easier way of doing it alongside with the musicians, without making, ja... it was quite a mess. And then this one animator, Wilfred Jackson, he had a basic musical knowledge and he knew about tempo and such, and he said that well music and animation has timing in common, so what if we use the metronome as a ... like a set beat for the animators and the musicians to work from, so then they can't stray you away from that like set tempo. So then they came up with a bar sheet, which then indicates the set tempos and frames per beat. So this was just a basic music ...

HC So that was dope sheets for them pretty much?

CJ Yes, basically like that. So they used... and this was also to indicate like words and such that they used on this, and that was the specific beats that they indicated there. But then also alongside that they wrote the music, er... the musicians wrote the music on the same page that the animators wrote what would happen in each frame, or where something might change, a movement might change and such. And then they both will refer back to this one page, when changing like the music or when changing the actions etc. So it made it very much easier for them both to work from like one central place. It then moved to more this type of layout, more horizontal, the music was still on there but the animators had like their own space to write down camera movements and changes, but still keeping with the bars for timing purposes specifically. Then now, animators still using bar sheets, more use this set or type of layout. They got rid of the music scores specifically, not the music, the staff, but ja they have like the frames, like you said you will draw up your key frames and such, and then they placed it there and write down the actions and what happens. But then nowadays they totally got rid of any musical score and they just write down in terms of the bars and ja, how it relates to that. So now I'm proposing that animators should have the basic musical knowledge. And by that I don't mean that you should be able to read a whole orchestration or anything like that, so I'm going to demonstrate this by making use of that scene that Samantha did, the dancing, and Bradley doing his ballet, Swan Lake. So for instance this is Swan Lake's orchestration. And it is 12 pages long, and it ends in quite a vigorous high note. So I don't propose that animators need to know that in any way, actually I just propose that they have the basic theme, which is that (singing) which we all know so well, and that from there on, because I think also when we animate we listen to the main melody and how it fits into everything, and then to analyse what happens and such. So for instance the musical knowledge that they would try, is like no, in basic terminology, terminology of tempo which is Andante which says it's moderately slow and Dolce espresso which says it's swiftly but still expressive, which can maybe even give an animator a more… I don't know, it tells you the mood and can maybe serve as a guideline towards which type of animating or which style you're going towards with this specific thing. Then also on this page, you see the dynamics, from the beat which is very soft, till very loud. So you can see that the music is moving towards that high point, so that will be the climax of the music. So if you're animating the dance, then you can maybe see that it should start moving softly, then bigger movements, and the climax should be there where obviously it's the loudest. I just propose that they know that higher notes are higher on the staff and the lower notes are lower. I don't propose that you know where Middle C is for instance. But then for instance, because I would – the reason I say this is because when you have higher tones, you won't necessarily have very deep and heavy movements, you will maybe have light tippy toe movements where you have lower notes, and then have a darker type of movements, heavier movements with the body weight and such. So the proposed setup will be this paper, this sheet which then is the ... ja, basically just this them that is written up in bar sheets, and then storyboards. This will also be more beneficial during production for planning purposes. It's also maybe a place where the director and the animator can both refer back to, even the musician, and they can... and the director can tell the animator where he's not happy with something or such. So then you can have your place where you will put in your drawing frames, you will have a place where you can write down the proposed action, and then you'll have the music as a guideline. Along with this I suggest that they receive that music, the pre composed music, along with the click track that indicates the set beats, so that they, because I know a lot of people without musical knowledge will not be able to recognise the set beats, and ja, maybe their

timing will be off. So I know we're living in a digital age, so I'm not proposing that this will be the only method, this will maybe be digitised and serve as a plug-in because I know Maya is not a... you only have your timeline, but here you can only see a part of your timeline in detail, on the programmes we use on the computer. Here you see the whole piece of music on one sheet. So if this is digitised it can maybe be a plug-in, and it can maybe even be an alongside reference footage, or you know, something that will enable the character animator to have not only visual or audio reference, but the visual as well. So that is my proposed method, what do you think?

HC I think it's got some advantages. The fact that you're using the keys, so it's in the programme, for example the synch, it's often tough to know exactly which frame to hit what note, now if you've got something like that, it tells you exactly the note is on this frame, you know you're hitting it right straight away, instead of just having a sign on your timeline, but very little indication when it's actually hitting it. Especially as you're doing play back and so on, according to maybe quick time frame or playing it to a frame back or frame forward, when it's you play, my play, different beats, and the soft play might play different beats, if you've got it visually in there, it can be a benefit.

CJ Ja and do you think these basic musical concepts will help the animator?

HC Ja it could help an animator, I think it's going to be quite hard to implement to the production side of things, or audio guys to I mean get everything done before they even start animating.

CJ Maybe it can even be a live document, like a Google docs for instance that has it as a live, so as the music gets updated by the musician, the animators get notified and it changes on the programme itself.

HC Yes.

CJ So maybe that's a way of… because I know a lot of people are working with temp tracks, and I know that's how it works at Triggerfish as well, so maybe that can be a solution for that. So yes, that's the proposed method. Thank you so much for taking the time to talk to me.

HC Pleasure.

CJ Uhm... so I just want to give you something here. Cool that was great, so those are for you to keep, just the basic musical concept and how it will relate to that specific frame as a... ja, if you use the bar sheets.

HC Thanks. Let me tell you this though, it's the reason why I'm not a pro soccer player right now.

CJ Is it? (laughter)

HC I decided this is what I would study music instead of playing soccer.

CJ Did you like it though?

HC Not as a child much, but I can see the benefit now though.

CJ Great. Well this is just to say thank you so much.

HC Thank you very much.

[END OF RECORDING]

[END OF INTERVIEWS]

Appendix 3: List of Video Clips on Accompanying CD

Video Clip 1: Musical scenes in *Khumba*

Video Clip 2: Comparison of ballet scene in showreel and film

Video Clip 3: Proposed digital bar sheet

Video Clip 4: Proposed Maya plug-in