

The Application of Exaggeration Convey Believability: Case Study of *Ping Pong The Animation (2014)*

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ABSTRACT

This study explores the role of exaggeration in animation, focusing on its impact on believability and storytelling, particularly within *Ping Pong The Animation (2014)*. Despite its longstanding use in animation, the significance of exaggeration still needs to be explored. By applying the 12 Principles of Animation and Laban Movement Analysis (LMA) theory, this research examines how exaggerated movements, in conjunction with LMA's Shape and Effort, enhance the narrative by intensifying characters' actions, expressions, and emotions during high-stakes ping pong matches. The deliberate exaggeration amplifies tension, excitement, and energy, making the sequences visually compelling and emotionally resonant. The methodology aims to provide animators with insights into creating believable movements in animation, even within fictional worlds. The findings suggest that exaggeration is a crucial tool for enhancing the appeal and authenticity of animated sequences, offering a valuable example for the animation industry. This research contributes to the understanding of exaggeration's role in animation and serves as a reference for future studies, highlighting the importance of effective movement in engaging audiences and creating immersive, artistic animations.

Keywords: *Exaggeration, Animation Movement, Believability, Principle of Animation, Stylised Animation.*

INTRODUCTION

The research will focus on *Ping Pong The Animation (2014)* and on understanding the usage of exaggeration in movements that could convey believability. We will discover how exaggeration, one of the Principles of Animation, helps the character feel alive in the TV series without making them feel out of place. Tokyo Anime Award Festival (n.d.) reported that Masaaki Yuasa, a renowned Japanese animator

and director, received the Tokyo Anime Award Festival 2015 (TAAF2015) award for his work on *Ping Pong The Animation* (2014).. This award recognizes his outstanding contributions to the world of anime. *Ping Pong: Animation* (2014) is a notable series in the anime industry due to its inventive plot and distinct animation style. Masaki Yuasa's talent and ingenuity have had a lasting influence on the medium. *Ping Pong: Animation* (2014) received high praise in the 2010s, earning recognition from notable sources like Polygon, Crunchyroll, IGN, and Forbes. These publications praised it as one of the best anime series of the decade, maintaining its position as a star in the industry.

Thomas and Johnson (1995) in *Illusion of Life* assert that changes in a character's expression can reveal their thought processes: "It is the change of shape that shows the character is thinking. It is thinking that gives us the illusion of life. It is life that gives meaning to the expression." This insight highlights the interplay between creativity and production, suggesting that the magic of animation transcends simple production processes. Our fascination with unique, complex characters—whether heroic, sensitive, humorous, or adventurous—stems from their individuality and emotional depth, contributing to their memorable nature and the compelling illusion of life depicted in Disney animation. The book *Illusion of Life* emphasizes that animators should focus on conveying the character's internal processes and actions to the audience rather than relying solely on humor. This approach reflects the broader ethos of Disney's creative philosophy, prioritizing deep character understanding over mere entertainment (Thomas & Johnston, 1981). As discussed by Martin (2020), Aristotle's concept of poiesis involves the imaginative process that generates high-quality intellectual and emotional output for reflection and character development. Whitehead (2003) further elaborates that poiesis encompasses ongoing, latent influences striving to manifest, offering the potential for novel discoveries in art and aesthetics. Although animation increasingly mirrors real life, it remains distinct from traditional cinema filmed in "real-time." Animation often uses twenty-four frames per second, with time described as "deferred" or "delayed," assembled during projection (Violette, 2015). Exaggeration, a core principle of animation, enhances characters' actions, expressions, and movements by pushing them beyond realistic bounds. This technique makes characters more dynamic and emotionally engaging, enriching storytelling and entertainment in animated films.

The investigation of how exaggeration affects the message's believability within animation studies still needs to be improved and limited. The research that has been found that is close to this topic focuses on the whole principle of animation with other methods like acting, and one study even uses the same method but a different approach. Although purposeful exaggeration is recognized as necessary in animation theory, few studies address this topic in depth, making it difficult to understand how audience perceptions of the plausibility of animated stories are influenced by purposeful exaggeration. There has been little research into the complex relationship between believability and exaggeration, highlighting a critical gap in the field and the need for more research into the mechanisms by which exaggeration adds to the credibility and immersive experience of animated content for viewers.

Feldman (1993, p.100) developed the theoretical framework of this analysis, which is a four-step structure of criticism consisting of description, analysis, interpretation, and judgment. It is hoped that this research will reach out to the public and further provide a bridge linking the public's understanding with matters related to the visual arts, enlightening the Malay symbolism along with greater appreciation of the Malay element of meanings behind an artist's effort and thus encourage public appreciation and understanding on the concept of beauty within the Malay cultural tradition context on visual arts. Therefore, this study aims to identify the principle of animation by reviewing existing research and then analyzing the use of exaggerated movements in the 2014 animated series *Ping Pong The Animation*. By examining how these exaggerated movements are implemented, the study will conclude their impact on the overall effectiveness and appeal of the animation.

LITERATURE REVIEW

The use of exaggeration inside animation

Exaggeration in animation involves magnifying or minimizing specific actions or feelings to an extreme degree. This technique works effectively with various animation principles, such as Squash and stretch, Timing, and Slow-in and slow-out. Exaggeration can also enhance the impact of scenes in editing and cinematography (Sultana et al., 2013). However, Thomas and Johnston (1981) recount a notable instance where Walt Disney criticized their use of exaggeration, seeking more realism. Disney and his animators had differing views: animators saw exaggeration as a distorted drawing, while Disney viewed it as an exaggeration of realism. Disney's aim was to make animations more believable and relatable by aligning them with real-life experiences. Despite this, Disney valued exaggeration that enhanced believability without compromising the character's authenticity.

Squash and Stretch have been fundamental in animation since Thomas and Johnston's *The Illusion of Life: Disney Animation* and are rooted in early animation techniques like phenakistoscopes. This principle allows a bouncing ball to squash along one axis and stretch along the other, preserving its mass while enhancing movement realism. Exaggerating this effect can introduce humor, a hallmark of Hollywood cartoons. For instance, Winsor McCay utilized Squash and Stretch in his 1911 animation of *Little Nemo in Slumberland* (Redrobe, 2014). In *A Letter to Momo* (2011), the animator Iwa employs a static pose for comedic effect, avoiding a redraw that would typically align with realistic physics (Wimshurst, 2019).

Cartoon physics, as described by Redrobe (2014), has been integral to the industry, creating an alternate universe where physical laws differ significantly from the real world. This allows for creative exaggeration and direct viewer engagement, as seen in classic cartoons like *Tom and Jerry* (1940) and *Fast and Furry-ous* (1949), where characters endure exaggerated physical harm.

Sergei Eisenstein's notes on Disney cartoons, written in the late 1930s and early 1940s, highlight the concept of plasmaticness. Eisenstein focused on the fluidity and elasticity of animation, where stroke drawing enables constant mutation and distortion of form without losing essence. He associated this with primordial vitality and animism. Eisenstein's concept parallels cartoon physics, which defies real-world logic while imbuing characters with life-like qualities (Redrobe, 2014).

In animation, exaggerated facial expressions can create powerful visual impressions that are challenging to achieve in live performance. In *Sausage Party* (2016), facial expressions not only enhance the character's visual appeal but also reflect their emotional depth. The degree of exaggeration should be guided by the plot and the animator's vision, ensuring it serves the narrative while maintaining believability (Zong et al., 2020).

Exaggeration should accentuate actions judiciously. It involves understanding the purpose of a sequence and applying exaggeration where it enhances realism and engagement. For example, slightly overextending an arm in a swing or emphasizing particular moments in dialogue can make animations more vibrant and compelling. The goal is to amplify actions to make them more dynamic without compromising the overall believability of the animation.

The importance of Exaggeration on movement inside of animation

Exaggeration in animation involves distorting actions or drawings to enhance impact and differentiate fiction from reality. Walt Disney's view of exaggeration focused on enhancing realism and believability, contrasting with animators who saw it as simply distorting drawings (Thomas & Johnston, 1981). Exaggeration can intensify comedic effects, as seen in *A Letter to Momo* (2011), where static poses create memorable scenes by diverging from realistic physics (Wimshurst, 2019).

Effective exaggeration also contributes to the illusion of believability. In *The Iron Giant* (1999), for instance, the character's movements and interactions with Hogarth convey authenticity and emotional depth, reflecting the core animation principles of anticipation, squash and stretch, and follow-through (Bishko, 2007). *Sausage Party* (2016) demonstrates how exaggerated facial expressions can amplify character emotions and appearance, showcasing the technique's limitless potential (Zong et al., 2020).

Purposeful exaggeration accentuates key actions and moments, making animations more engaging while maintaining believability (Sultana et al., 2013). Research by Hammer Adamo (2020) suggests that controlled exaggeration enhances the appeal of animated characters. Thus, exaggeration remains a crucial tool for infusing humor, creativity, and emotional resonance into animated works.

Overview of Believability in Animation

Characters in animation do not necessarily correspond to real-world rules. Characters such as Wile E. Coyote from *The Road Runner Show* (1949) and Tom from *The Tom and Jerry Show* (1975) regularly defy gravity before crashing. Smear frames are widely used by Western animators to make their figures appear stretched in order to make the animation appear more realistic and smooth. Because animation has its own set of realism that differs from how the world works, Ollie Johnston and Frank Thomas introduced their own set of rules called the 12 Principles of Animation in their book *The Illusion of Life: Disney Animation* to make their animation look more believable. The twelve principles are staging, timing, squash and stretch, anticipation, exaggeration, slow in and slow out, simple action and pose-to-pose arc, follow through and overlapping action, secondary action, solid drawing, and appeal (Coron, 2023). These laws, as previously established, only apply to animation since the real world does not work in the same way that animation does.

While a fictional universe is not the same as our own, some laws apply to all characters that inhabit it. A character should constantly be modified to the world in which they live through daily routine, culture, diet, interaction, and thought process to appear more believable. A fictional universe; must function similarly to our world in that individuals must follow their customs and conduct what is considered normal in their world. The characters in *Hilda* (2018), for example, are regularly welcomed with the sight of a flying dog-bear hybrid and the yearly thunderbird festival. The world-renowned director James Cameron even created a functional language called Na'vi language from scratch for use in his film franchise *Avatar* (2009).

Importance of Believability in Animated Content

Animation has traditionally maintained a complex relationship with realism. Unlike realist forms, animation does not inherently aim for realism, despite realism emerging from literary and artistic studies in the 19th century. Animators often start by observing real-life movements, which they then translate into their animations. Sultana et al. (2013) argue that beginner animators often rely on memorizing and repeating ideas from existing animations rather than deeply understanding and embodying the movements

and emotions they observe. Thomas and Johnston (1995) criticize this approach, suggesting that animators should not merely replicate movements but instead fully engage with and reinterpret performances. Disney, for instance, used the multiplane camera to create depth and realism by differentiating foreground, middle ground, and background layers, enhancing the cinematic experience (Redrobe, 2014).

Actors and animators share similarities in their techniques. Naremore (1990, cited in Sultana et al., 2013) notes that both rely on real-world observations to shape their characters. Each character's unique personality and behavior are informed by the animator's understanding of human diversity. Bjorklund (2009, cited in Sultana et al., 2013) and Hooks (2005, cited in Sultana et al., 2013) emphasize that realistic movement fosters a deeper connection between the audience and the character, making the character appear more lifelike and engaging. Matteowatz (2021) highlights how *Paprika* (2006) uses surreal movements to evoke unsettling effects, demonstrating the balance between realism and stylistic exaggeration.

Facial expressions play a crucial role in conveying emotions and enhancing character depth. Realistic facial animations foster a stronger emotional connection with the viewer. Techniques like motion capture, which records real actors' facial expressions, allow animators to create highly realistic and engaging characters. According to Wimshurst (2019), animators with exceptional skill, such as Hiroyuki Okiura, have the ability to control scene realism or stylization effectively.

Realism in animation not only enhances believability but also helps in forming emotional bonds with the audience. Thomas and Johnston (1981) suggest that audiences connect with characters through shared emotions and experiences. For instance, a Disney crew member remarked on the emotional impact of detailed animation, noting that it made the character relatable and evoked personal memories. This indicates that meticulous animation can profoundly affect viewers, making them empathize with characters and their situations. The animator's skill in applying principles, character development, and action analysis is crucial for creating authentic and compelling animations (Thomas & Johnston, 1981).

Laban Movement Analysis (LMA) as an observation method

Understanding exaggeration in animation is complex and often relies on subjective interpretations of motion. Laban Movement Analysis (LMA) offers a systematic framework for analyzing physical movements in relation to emotions and mental states. It has been applied to create high-quality datasets for machine-learning algorithms that recognize emotions through body language (Wu et al., 2023). LMA is utilized across various fields, including social sciences, neuroscience, technology design, forensics, education, and health research, making it a versatile tool for analyzing and documenting human movement.

LMA categorizes movement into five components: Body, Effort, Shape, Space, and Phrasing. The Body component focuses on the biomechanical aspects of movement, assessing ease and authenticity (Bishko, 2007). Wu et al. (2023) note that improvements in understanding body language can enhance communication with assistive robots, provide diagnostic support in psychiatry, and aid in detecting deception. The Effort component, popular in theatre, distinguishes between Light and Heavy Weight, Direct and Indirect Space, Sustained and Sudden Time, and Free and Bound Flow (Bishko, 2007). Shape includes curving and broadening movements, contributing to expressive and spatial orientation (Wu et al., 2023). Space involves intentional movements like rising and elongation, while Shape examines movement form and structure (La Viola et al., 2022). Phrasing organizes movement into stages: Preparation, Action, and Recovery, akin to sentences in language or phrases in music (Bishko, 2007).

Samadani et al. (2013) created a dataset to quantify these components for robotic movement analysis, showcasing the practical application of LMA.

Unlike the Principles of Animation, which dictate specific styles of movement, LMA is style-neutral and focuses on authenticity and intent. It provides a detailed understanding of movement that enhances the realism of animations by linking stylistic elements to their functional components (Bishko, 2007). For instance, while the Principles of Animation might describe Squash and Stretch as creating weight, LMA allows for a nuanced analysis of how these principles interact within a movement phrase and derive deeper meaning (Bishko, 2007). Thus, LMA is crucial for understanding and analyzing emotions and mental states through body language and movement.

RESEARCH METHODOLOGY

The researcher is writing this research with the expectation that it may be utilised as a reference by students and other scholars in future investigations. Every animator works to make his animation entertaining and communicative with the viewer. To accomplish this goal, animators must consult with and conduct studies in the areas of acting, duplicating, and interpreting movement in real life. Animators can learn more about every critical aspect in making movement inside animation believable to the audience, even though it is a fictional universe and elements do not exist in the real world, from this small piece of research. People in the animation industry will struggle to figure out what makes a decent movement inside an animation without the assistance of any reputable external resources. If any one part of what constitutes a believable movement fails, the audience will find it unbelievable and strange to observe. Even if the animation has a strong character and story, people will notice the strange or uncanny movement within one of the animations.

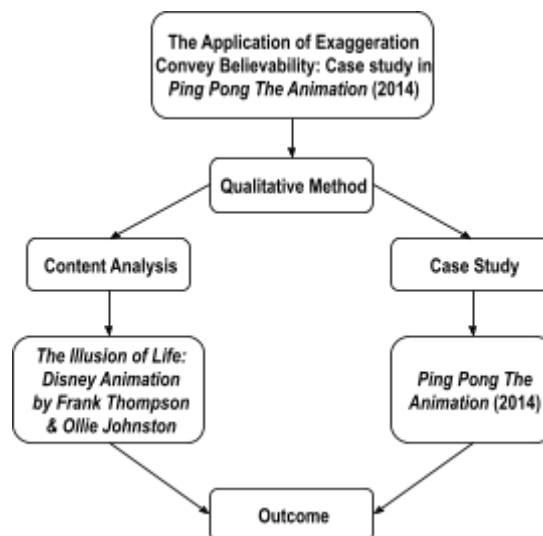


Figure 1. Methodology

FINDINGS

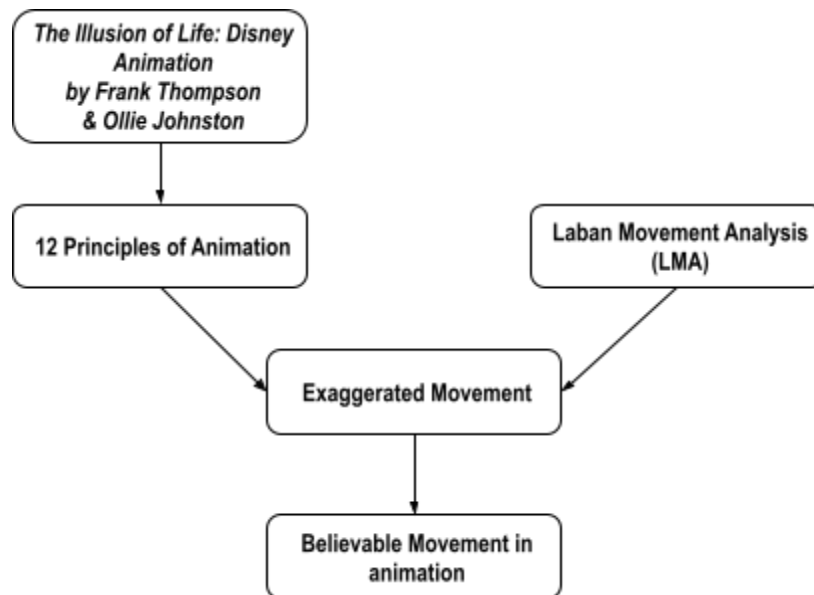


Figure 2. Conceptual Framework

Table 4.1. Findings summary of exaggeration written by experts and scholars.

Title (Data For Exaggeration)	Author	Description Elements	Characteristic
Exploring believable character animation based on principles of animation and acting (2013)	Nekhat Sultana, Dr Nico Meissner & Dr Forest Lim Yan Peng	<p>- Exaggeration in animation involves magnifying or minimizing actions or emotions to an extreme degree, an Exaggerated technique that complements others like Movement Squash and stretch, Timing, and Slow-in and slow-out.</p> <p>- Exaggeration should be applied purposefully to accentuate actions and moments, making animation more realistic and engaging. Exaggeration involves identifying key areas in dialogue, including Expressions or sequences that require emphasis and amplifying them while maintaining believability.</p>	<ul style="list-style-type: none"> ● State that exaggeration magnifies or minimizes based on the action to an extreme degree. ● By amplifying or reducing the emotion to a level of extreme could.
Animating Film Theory (2014)	Karen Redrobe	<p>- Based on Redrobe (2014), cartoon physics, a long-standing tradition, defies real-world rules, creating an alternate universe in the animation itself. Characters in shows like Tom and Jerry from The Tom and Jerry Shows (1975) engage in absurd antics, defying logic and physics.</p> <p>- One of the methods that could be identified in most animations that apply exaggeration is squashing and stretching</p>	<ul style="list-style-type: none"> ● Distorting a character by squashing and stretching is a method that could be used for exaggeration. ● The fluidity and elasticity in animation help exaggeration without losing its true form

		<p>the character to the point of distorting. Squash and stretch, which are exaggerated , dating back to the early days of movement animation, capture the elasticity of the human body and the whimsical rubber hose style. A bouncing ball exemplifies this technique, combining realism with humor (Redrobe, 2014).</p> <p>- It emphasized the fluidity and elasticity of lines and figures in animation, highlighting the stroke drawing technique's capacity for form mutation without a true loss (Redrobe, 2014).</p>	
The Uses and Abuses of Cartoon Style in Animation (2007)	Leslie Bishko	<p>- Cohesive Illusion: Bishko (2007) notes that animation creates a cohesive illusion, allowing viewers to suspend disbelief and accept characters.</p> <p>- Character Connection: Emotional settings help us connect with characters, as seen in Hogarth and the Giant's relationship, where exaggerated movement enhances believability.</p> <p>- Movement and Authenticity: Exaggerated movement shows character authenticity. Key animation principles—anticipation, squash and stretch, and follow through—are essential for creating believable, expressive characters (Bishko, 2007).</p> <p>- Movement as Expression: Bishko (2007) emphasizes that movement is the core of animation, similar to how music is read through melody. It should be central to understanding animated films.</p>	<ul style="list-style-type: none"> ● State animation's main focus is movement ● It helps to provide characteristics, believability, and a level of acceptance. ● Exaggeration helps to provide believability to the viewers. ● It also helps to set the dramatic feeling, which creates strong feelings in the audience. ● Serving as the foundation, it helps bring expression and style to life.
The Illusion of Life: Disney Animation (1981)	Frank Thomas & Ollie Johnston	<p>- An easy understanding of exaggeration is distorting a drawing to increase the impact, which differentiates reality and Exaggerated fiction. However, Walt Disney's Movement perspective on exaggeration differed from that of his animators. While animators saw it as a distorted drawing, Walt aimed for an exaggeration of realism, emphasizing believability (Thomas and Johnston, 1981)</p>	<ul style="list-style-type: none"> ● A distorted animation could help with the affectability of the animation ● It also helped to differentiate reality and fiction. ● On the other hand, believability could be emphasized with the use of exaggeration.
Research on Character Expression	Min Zong, Zongjin Qi & Ze Zong	<p>Exaggerated Movement</p> <p>- Exaggeration extends to facial</p>	<ul style="list-style-type: none"> ● Character performance or acting

Shaping in Animation Movies (2020)		<p>expressions, enhancing character performances in animation. <i>Sausage Party</i> (2016) exemplifies the limitless Exaggerated exaggeration possibilities, amplifying the Expression of both appearance and character emotions (Zong et al., 2020). Exaggerated Appeal</p>	<p>could be enhanced with the help of exaggeration.</p> <ul style="list-style-type: none"> ● Exaggerating the expression brings more life and extends the level of emotion ● The level of exaggeration is limitless to the point that the appeal of a character is enhanced.
<p>Expressive Features for Movement Exaggeration (2002)</p> <p>Audience Perception of Exaggerated Motions on Realistic Animated Animal Characters (2020)</p>	<p>James W. Davis & Vignesh S. Kannappan</p> <p>Mackenzie Hammer & Nicoletta Adamo</p>	<p>- Davis and Kannappan (2002) Experimented and created a method to help animators with the application of Movement exaggeration to be more efficient. They believe exaggeration can be used to create natural-looking exaggerated versions of actions, adding Expression, expressiveness, and style to animations.</p> <p>- There is a study done by Mackenzie Exaggerated Hammer, and his findings suggest that Movement, while some level of exaggeration, can enhance the perceived believability and appeal of photorealistic animated Appeal animal characters, high exaggeration maybe more effective in achieving Exaggerated this outcome (Hammer & Adamo, Expression 2020).</p>	<ul style="list-style-type: none"> ● Explore methods where exaggeration creates natural-looking actions that add more life to the character. ● The expressiveness of the character could be visually enhanced. ● Stated high level of exaggeration helps to achieve a level of believability and appeal even toward photorealistic animated animal characters.
Japan's Greatest Character Animator - Sakuga Analysis of Hiroyuki Okiura (2019)	Howard Wimshurst	<p>- In A Letter to Momo (2011), static poses are used for comedic effect, Exaggerated diverging from human physics to Emotion create memorable scenes (Wimshurst, 2019).</p>	<ul style="list-style-type: none"> ● Simply exaggerating a character from an action into a static pose helps to create a funny and memorable scene.

Using the keywords based on the topic of this research, multiple previous studies have been used to conclude and create a base of understanding of exaggeration. Creating a specific term to specify certain elements that are commonly used and mentioned about exaggeration helps to create and differentiate parts of exaggeration. This research aimed to provide and help to define elements of exaggeration that create a broader understanding of exaggeration and provide an enhancement of the recurrent themes and terminology that surround exaggeration. A simple terminology was created to help understand exaggeration a lot better and categorize certain elements inside of exaggeration. Most of the research about exaggeration mainly focuses on exaggerating the body to the level of cartoonish feel, but it lacks categorization or creating a simple term to help differentiate other uses of exaggeration apart from exaggerating the body.

Howard Wimshurst ✓ Table 4.2. Most frequently mentioned types of exaggeration in previous studies

Author	Keyword			
	Exaggerated Movement	Exaggerated Appeal	Exaggerated Expression	Exaggerated Emotion
Nekhat Sultana, Dr Nico Meissner & Dr Forest Lim Yan Peng	✓		✓	
Karen Redrobe	✓			
Leslie Bishko	✓		✓	
Frank Thomas & Ollie Johnston	✓			
Min Zong, Zongjin Qi & Ze Zong	✓	✓	✓	
James W. Davis & Vignesh S. Kannappan	✓	✓	✓	
Mackenzie Hammer & Nicoletta Adamo	✓		✓	

Even though types of exaggeration could be categorised and differentiate, exaggerated movement is fundamental which serves as the base that enhances to create dynamic and unique motion. It's the technique that goes beyond realism, magnifying actions and gestures to create a dynamic and captivating experience. This enhanced movement not only grabs attention but also adds an entertaining quality to the animation.

While exaggerated appeal, exaggerated expression, and exaggerated motion could be vital elements, they all find their strength in exaggerated movement. When movements are exaggerated, they become inherently more appealing, drawing the audience in. This enhanced appeal then bolsters the expression and emotion conveyed by characters, making their reactions and feelings more vivid and engaging. Essentially, exaggerated movement stands as the cornerstone, elevating the attractiveness and depth of animated sequences and driving the captivating nature of the entire storytelling process.

Laban Movement Analysis (LMA)

Leslie Bishko's 2007 work, *The Uses and Abuses of Cartoon Style in Animation*, explores Laban Movement Analysis (LMA) through its five categories: Body, Effort, Shape, Space, and Phrasing. Phrasing organizes movement over time, akin to a sentence or musical phrase, involving stages like Preparation, Action, and Recuperation. Bishko emphasizes that uniqueness in movement is conveyed through individualized patterns in Body, Effort, Shape, and Space, with Body movement shaping intent and coordination. Unlike traditional Animation Principles, which often adhere to specific styles, LMA remains style-neutral and focuses on intent-to-action, offering more profound insights into authenticity. The LMA methodology involves observing, describing, and interpreting movement, focusing on its parameters and terminology. Bishko argues that LMA enriches the understanding of animated movement by highlighting the communication within the movement, with Shape showing how inner attitudes influence external forms and Weight conveying the materiality of motion. The Kestenberg Movement Profile (KMP) is noted for applying LMA in animation, explaining how breath flow aids in shape adjustments, similar to Squash and Stretch. Wu et al. (2023) delved into LMA at the Laban/Bartenieff Institute of Movement Studies. This research reaffirms LMA's key categories and style-neutral approach, emphasizing intent-to-action for authenticity. It underscores how LMA's methodology enhances the understanding of movement in animation, focusing on communication through movement. Key concepts

like Shape and Weight are essential, with Shape reflecting inner attitudes and Weight illustrating the materiality of form in motion. The study also validates LMA as a systematic method for analyzing human movement, showing how personal patterns contribute to the movement's uniqueness and dynamism. C. La Viola, L. Fiorini, G. Mancioffi, J. Kim, and F. Cavallo (2022) apply LMA to explore emotional connections between humans and robotic arms. It uses LMA's categories to enhance the understanding of movement form and structure, focusing on the relationship between body parts to improve the believability of movement, especially in human-robot interactions. Ali-Akbar Samadani, Sarahjane Burton, Rob Gorbet, and Dana Kulic (2013) quantify LMA components for hand and arm movements. It evaluates effort elements like weight, time, space, and flow, as well as shape components such as direction and movements. The study introduces methods for quantifying these components and creates estimations for Laban Effort's Time. It also proposes a new approach for quantifying Shape direction by assessing trajectory curvature, advancing the measurement and analysis of affective movements in robotics.

Laban Movement Analysis (LMA) has been used and mentioned in many previous studies to gather information on various patterns and applications. Researchers observe and analyse movement qualities using LMA elements like Effort, Shape, Space, Body and Phrasing which could be applied and used for many things mainly focusing on movement. Data in Table 4.3 showed many fields of position use LMA to create a base of understanding for their objective like creating a robotic arm and understanding the human emotion.

The gathered data serves multiple purposes, from guiding training and education by applying these principles to enhance movement efficiency and artistic expression to advancing research in fields like psychology, rehabilitation, and performance arts. Ultimately, this comprehensive data collection in Laban Movement Analysis serves as a valuable resource for understanding human movement across various disciplines and for improving techniques in artistic expression, therapy, and physical training.

Table 4.4: Most frequently mentioned types of Laban Movement Analysis in previous studies


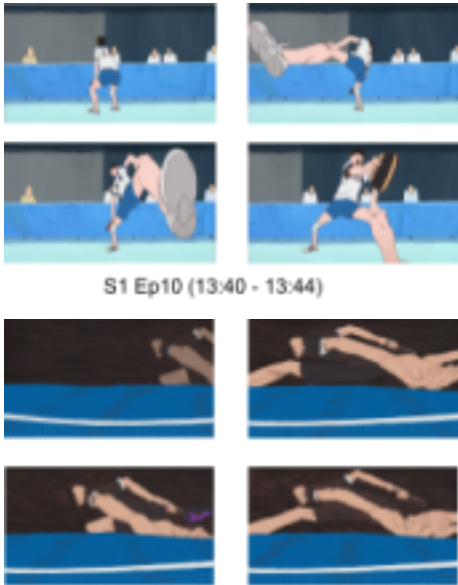
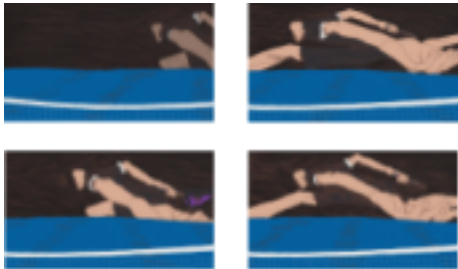
Author	Keywords			
	Laban Effort	Laban Space	Laban Shape Laban Body	Laban Phrasing
Leslie Bishko			✓ ✓	
Laban/Bartenieff Institute of Movement Studies	✓	✓	✓ ✓	
Chenyan Wu, Dolzodmaa Davaasuren, Tal Shafir, Rachelle Tsachor, James Z. Wang	✓	✓	✓ ✓	✓
C. La Viola; L. Fiorini; G. Mancioffi; J. Kim; F. Cavallo	✓	✓		
Ali-Akbar Samadani; Sarahjane Burton; Rob Gorbet; Dana Kulic	✓		✓	

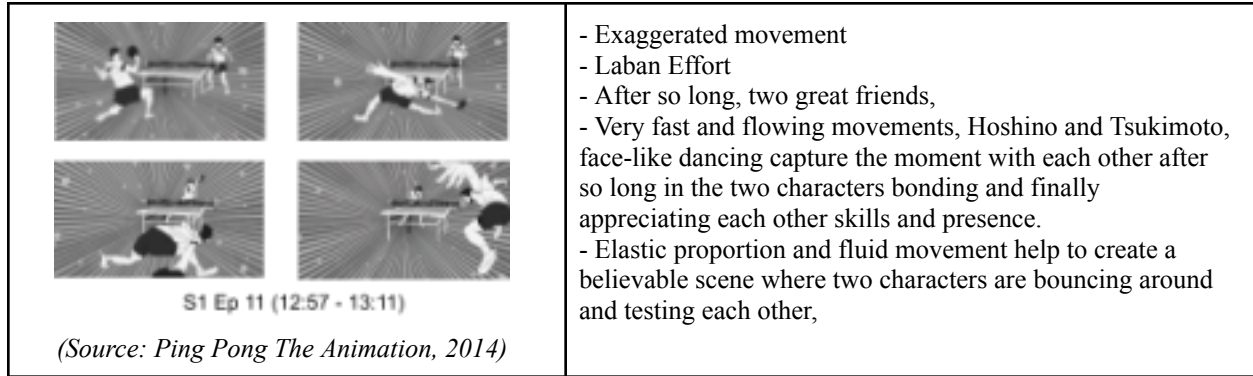
Laban Effort and Laban Shape are key pillars in Rudolf Laban's Movement Analysis approach to understanding movement. Laban Effort explores the different ways movements are carried out, such as how heavy or light they feel, their speed, and the flow they possess. This helps describe and understand

the energy, intention, and expression behind movements in dance, theatre, and other physical activities. Laban Shape, on the other hand, focuses on how the body takes up space and changes its form. It's about creating different shapes and contours by altering the body's position, like stretching, curving, and expanding, to express different emotions or intentions. Both Effort and Shape play big roles in understanding how movements work and how the body communicates through them, making them essential aspects of Laban's movement analysis. This exploration of shape enables a deeper understanding of how the body occupies and influences space, conveying emotions, intentions, and communication through its configurations. Together, Effort and Shape form the backbone of Laban's methodology, offering an extensive framework for comprehending the complexities and uniqueness of human movement across diverse disciplines and artistic expressions.

RESULT

Table 5. Ping Pong The Animation (2014) Laban movement analysis

SCENES	EXAGGERATED MOVEMENT LABAN MOVEMENT ANALYSIS
 <p>S1 Ep3 (4:58 - 5:00)</p> <p>(Source: Ping Pong The Animation, 2014)</p>	<ul style="list-style-type: none"> - Exaggerated movement - Laban Effort - Rivals between Akuma, on the - The heavy bash into the face of left, and Hoshino, on the right, another character creates a head-on-head action when impact to show the relationship meeting each other after a long between the two rivals time. - Exaggerating the character on the left by shoving into the face of the other character shows that he is trying to convey dominance.
 <p>S1 Ep10 (13:40 - 13:44)</p>  <p>S1 Ep10 (4:52 - 4:53)</p> <p>(Source: Ping Pong The Animation, 2014)</p>	<ul style="list-style-type: none"> - Exaggerated movement - Laban Shape - Hoshino, the character in the - Turning the body and advancing scene, facing defeat and enduring the whole body to be wider and an injury on his knee. bigger from a smaller form creates an understanding that the - By exaggerating the way the character gains some sort of character turns, it helps to show a confidence boost that he gains his confidence back and regains his happy-go-lucky - By heading in a certain direction self. Also helps to keep the continuity between characters. - Exaggerated movement - Laban Effort & Laban Shape - Kazama is squash and elongated - Making the character look like to create a dynamic while lightweight and dashing through running. Air capture an intense and fast motion - It helps to create an illusion of fast and showing that Kazama could reach the other end of the table tennis court.



The series showcases stunning and dynamic exaggerations throughout its animation style, effectively utilizing this technique to convey the intense emotions, competitive spirit, and personal struggles of its characters. The exaggerated sequences in *Ping Pong The Animation* (2014) contribute immensely to the storytelling by magnifying the movements, expressions, and emotions of the characters during their high-stakes ping pong matches. The animation's deliberate exaggeration amplifies the tension, excitement, and raw energy of each match, making them visually captivating and emotionally resonant. It shows how exaggeration plays a critical role in creating a believable and immersive story and animation, engaging the audience emotionally as well as resulting in a successful and artistic animation. We can say that in this series, focusing on exaggerated movement with the observation method of Laban Movement Analysis's Effort and Shape creates a base of understanding and observation to elaborate and interpret their movement without having to assume or roughly explain their meaning behind the movement that is conveyed in each of the sequences.

CONCLUSION

From this research, we can understand that exaggeration is essential in making an animation. The process of creating a great and believable motion is critical to creating a more immersive and engaging visual, as well as manifesting a more critical experience for viewers. Through the research and studies, exaggeration could be concluded is not about creating unrealistic or absurd portrayals. Instead, it's a deliberate artistic choice to amplify certain aspects of movement, expression, emotion or appeal beyond what is typically seen in real life. This technique breathes life into characters and scenes by emphasising actions or reactions in a way that is more expressive, engaging and memorable. Laban Movement Analysis (LMA) provides a framework for animators and researchers to have a base of understanding on exaggerated movements by manipulating these elements. Exaggeration compliments each other with LMA's Effort and Shape, where it emphasizes the weight or timing of a character's actions and can create a more pronounced and impactful visual storytelling experience. Additionally, the exploration of Shape within Laban's framework allows animators to exaggerate body configurations, enabling the portrayal of emotions or intentions more vividly. Exaggeration with the help of LMA is a fundamental tool that could give animation its unique ability to convey complex emotions and narratives in a unique manner, ultimately creating a more immersive, believable, and memorable experience for the audience.

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