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The Aesthetics and Psychology Behind Horror Films

An Honors Program Thesis

by

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Psychology

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Date

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Abstract

We usually define “fear” as a negative emotion, which is unpleasant. Normally, we desperately want to avoid this emotion because it causes distress and terror. However, the aesthetics and psychology behind horror films explain “fear” can be a pleasurable experience. “Fear” is an essential element in horror genre, which is why we consistently crave the adrenaline rush in scary films. Neuroscientists, psychologists, and filmmakers constantly study viewers’ fear responses to see which techniques can terrify audiences. This thesis demonstrates the different methods filmmakers create to attract the audience in enjoying horror films. As well as, including psychological and scientific studies to explain how scary films affect our brain and body.

Keywords: horror films, psychology, aesthetics, mise-en-scène, cinematic technique

Introduction

Why do we watch horror films? What makes horror films so exciting to watch? Why do our bodies sweat and muscles tense when we are scared? How do filmmakers, producers, sound engineers, and cinematographers specifically design a horror film? Can horror movies cause negative, lasting effects on the audience? These are some of the questions that are answered by exploring the aesthetics of horror films and the psychology behind horror movies.

Chapter 1, “The Allure of Horror Film,” illustrates why we are drawn to scary films by studying different psychological theories and factors. Ideas include: catharsis, subconscious mind, curiosity, thrill, escape from reality, relevance, unrealism, and imagination. Also, this chapter demonstrates why people would rather watch fiction films than documentaries and the motivations for viewing graphic horror.

Chapter 2, “Mise-en-scène in Horror Movies,” includes purposeful arrangement of scenery and stage properties of horror movie. Also further discussing what made filmmakers, cinematographers, sound engineers, and film crew intentionally design a scene and create specific techniques.

Chapter 3, “Science Behind Horror,” explains the science behind our physiological response and fear responses in the brain. This chapter answers what happens to our body and brain when we watch a scary scene. This chapter also introduces neurocinematics, which is an emerging field of scientists and filmmakers using fMRI and EEG to read people’s brain activity while watching movie scenes.

Chapter 4, “Dark,” presents the negative consequences after watching a horror film. Sometimes Post-traumatic stress disorder develops in children and adults from watching

shocking images. PTSD can refrain the person from doing everyday activities due to recurrent flashbacks of scary images. In addition, this chapter discusses cinematic neurosis from psychological cases of patients who were emotionally unstable after watching horror films.

Chapter 1: The Allure of Horror Film

Overview

Although watching horror films can make us feel anxious and uneasy, we still continue to watch other horror films one after another. It is ironic how we hate the feeling of being scared, but we still enjoy the thrill. So why do we pay money to watch something to be scared?

Eight Theories on why we watch Horror Films

From research by philosophers, psychoanalysts, and psychologists there are theories that can explain why we are drawn to watching horror films.

The first theory, psychoanalyst, Sigmund Freud portrays that horror comes from the “uncanny” – emergence of images and thoughts of the primitive id. The purpose of horror films is to highlight unconscious fears, desire, urges, and primeval archetypes that are buried deep in our collective subconscious – images of mothers and shadows play important roles because they are common to us all. For example, in Alfred Hitchcock’s *Psycho*, a mother plays the role of evil in the main character’s subconscious. We watch scary movies because they help us to release our anxiety and fears deep inside our conscious.

The Greek Philosopher Aristotle introduced “catharsis,” which is a process where we release our negative emotions by watching violent or scary movies. In other words, they help us to “purge” our aggressive emotions. We also burn our negative feelings and worries about the real world and expel them by watching horror films. In the end, the killer, the antagonist has to suffer, which gives the ultimate resolution for the viewers.

Dr. Dolf Zillman’s Excitation Transfer theory (1983) is a continuation of the catharsis theory. From the article, “The Psychology of Scary Movies,” author John Hess comments on ETT:

Negative feelings created by horror movies actually intensify the positive feelings when the hero triumphs in the end... And even some small studies have show that people's enjoyment was actually higher during the scary parts of a horror film than it was after.

A third theory of the Excitation-transfer process is not limited to a single emotion. For example, at first, when the audience sees the villain defeating the hero they are angry, but this excitation changes to pleasure when the second stimulus occurs when the hero wins. This "pleasure" makes up the third theory, Dispositional Alignment Theory, which indicates that we like watch horror movies because we want the "bad" people in the film to be killed.

Noel Carroll, film scholar states the idea that horror films is the product of curiosity and fascination. In his article, "Why Horror?" Carroll quotes that, "horror genre gives every evidence of being pleasurable to its audience, but it does so by means of trafficking in the very sorts of things that cause disquiet, distress, and displeasure" (Jancovich, 2002, p. 33). He talks about audience's reactions to the horror that exists outside of everyday. Therefore explaining that the emotions of disquiet, distress, and displeasure are not pleasurable, but horror films can manipulate these emotions as quite enjoyable. Also, according to Carroll, we want to understand why monsters exist in the first place and they are fascinating because they are part of fantasy. He states, "thus, we are attracted to, and many of us seek our, horror fictions of this sort despite the fact that they provoke disgust, because that disgust is required for the pleasure involved in engaging our curiosity in the unknown and drawing it into the processes of revelation, ratiocination, etc" (Jancovich, 2002, p. 37). Carroll argues that "disgusting" is "fascinating" since it violates our classificatory schema. Moreover, Carroll states, "all narratives might be thought to involve the desire to know...However, the horror fiction is a special variation on this general narrative motivation, because it has at the center of it something which is given as in

principle unknowable” (Jancovich, 2002, p. 35). This meaning, the audience already knows that the plot and the characters are already “disgusting”, but the surprises in the horror narrative through the discovery of curiosity should give satisfaction.

Marvin Zuckerman (1979) proposed that people who scored high in sensation seeking scale often reported a greater interest in exciting things like rollercoasters, bungee jumping and horror films. He argued more individuals who are attracted to horror movies desire the sensation of experience. However, researchers did not find the correlation to thrill-seeking activities and enjoyment of watching horror films always significant.

The Gender Socialization theory (1986) by Zillman, Weaver, Mundorf and Aust exposed 36 male and 36 female undergraduates to a horror movie with the “same age, opposite-gender companion of low or high initial appeal who expressed mastery, affective indifference, or distress.” They reported that young men enjoyed the film mostly when female companions were distressed by the movies. Young women enjoyed the movie mostly when their male companions were less frightened.

DJ Skal, cultural historian, explains that horror films are a reflection of our societal fears. In his book, *The Monster Show*, he talks about horror entertainment links between the great social crisis of our time. David J. Skal’s work is described as “directly related to the country’s current economic woes and fears about a failing safety net and a changing world.” Horror entertainment is the outlet to let out social anxieties and become a place to escape from societal failures.

Professor Glenn Sparks told *Seeker*, a media of discovery, “fear is a negative emotion that comes about when people are under siege or threat.” But in the case of watching horror films or going on rollercoasters, people enjoy fear that comes with experience. According to *Seeker*,

“the enjoyment some people get from fear is likely not from fear itself but from “the physical and emotional release that follows scary situations.” In other words, *Seeker* explains, “ for certain individuals, the desire to feel fear is a manifestation of an adrenaline-seeking personality.”

Three Factors That Attract the Audience to Horror

In his paper, “Understanding the Popular Appeal of Horror Cinema: An Intergrated-Interactive Model,” psychologist Glenn D. Walters identifies three primary factors that attract the audience to horror entertainment. First, filmmakers and producers create elements of mystery, suspense, gore, terror, and shock into their film, which creates tension. Different mise-en-scene, including lighting, costume, and incongruous sounds, creates the suspense leading to a big reveal. In the same fashion, multiple size shots and camera angles like long tracking shots can capture the character’s nervousness leading to tension.

Another allure of horror is relevance. The audience finds some kind of relevance in the film, whether it can be universal like the fear of death, the unknown, or cultural, social, religious relevance. For example, South Korea is a highly competitive country and is the one of the top countries with the highest suicidal deaths. Because of strict studies in middle school and high schools, many students commit suicide by falling off of the rooftop of their school. There are many films with young girls coming back to haunt their enemies with long black hair and pale skin—a highly profitable film genre due to its social relevance.

In a horror movie, having too many realistic qualities can lose its entertainment value. The audience knows that what is happening on the screen is unreal. Sometimes when we see a protagonist running into the trap of his antagonist, we scream “WHY?!” because it is obvious the protagonist should have ran in the other direction.

Imagination Influences

Our imagination has a great influence while we watch a horror movie. Every scene in the film, we imagine what the protagonist is going to go through. For example, in the *Jigsaw* film sequels or *Final Destination* sequels movie directors create new ideas how the characters are going to be killed off. During the movie horror filmmakers use tension and suspense to grab our attention because we are curious what is going to happen to each character. Furthermore, even after the film we wonder about the mystery of the next sequel and anticipate the next film release.

Moving Images Captivating Our Consciousness

During the film, images and shots that constantly change on the screen become a continual “catalyst.” “Moving images rouse our consciousness keeps it at alert. They inform us that ‘something’ is about to happen even before the why and wherefore can be specified...each shot is a surprise effect, a pure emotional shock...” (Mitry, 1997, p. 84). During horror films, our consciousness is always alert, expecting something to pop out or show a gruesome image. There is always a scene where it is extremely silent while the character is alone and helpless. Even if we know the character is going to die and we expect in the next scene, we are sometimes left in awe—perhaps it is the way the character was killed. Also psychologists Freud and Jung made different psychoanalytic theories why we love to watch horror movies. From his essay “The Uncanny,” Freud (1919) describes horror as a “manifestation of the uncanny reoccurring thoughts that are lying in our consciousness by repressed by our ego, but is not familiar to us.” But in essays from “The Archetypes and the Collective Unconscious,” Jung (1968) argues that, horror films are popular because the movies “tap into primordial archetypes buried deep in our collective subconscious – images like shadow and mother play important roles in the horror

genre”. The audience is going through hypnosis in its “captivation” of our consciousness, compared to our state when we are dreaming (Mitry, 1997, p. 82). We are so absorbed into the plot and the quick images passing by, that even if we already know what is going to happen, the audience acts and reacts with the actor.

Separation Between Reality and Screen

Another reason why we watch movies is because we are able to participate in the adventures of the characters risk-free. Author Jean Mitry says, “it lets me be committed to situations from which I can voluntarily withdraw...” Certainly, participating in movies give the actual experience the characters go through. We have the freedom to choose the extent of our participation with the characters. If settings and plots were real like those in horror films, it can put us in “series of consequences” we can never escape (Mitry, 1997, p. 86). But because we are experiencing through screen and imagination we are assured that we will not face any dangers. Sometimes we get lost into the plot, as if the character on screen is us, but as soon as something dangerous occurs we come back to our senses and withdraw ourselves from the character.

Popular horror genre: Zombie

There are numerous zombie movies and television shows such as *The Walking Dead*, *World War Z*, *Train to Busan*, *Resident Evil*, *I Am Legend*... Whenever we watch these films and TV shows, some of us will assure ourselves zombies are not real to remind safe. In *The Aesthetics and Psychology of the Cinema*, Jean Mitry states that as the character walks toward the screen and comes closer to the audience, the audience knows the character would not be able to touch them because there is a separation between the character and the audience. There is a difference between what is on the screen, which is imaginary, and the audience’s space, which is reality (Mitry, 1997, p. 80).

Zombie is one of the most popular horror genres. It raises the question, if you were in a situation where everyone is a zombie except for you and a group of friends, how would you survive?” As stated before, the division between the character and us gives us relief and the plot becomes exhilarating. In the article, “Why the Pain of Sitting Through Scary Movies Is Actually Good for You,” Paul J. Patterson, PhD, of Saint Joseph’s University says zombies are like a “disease following you” and “it’s about the environment degrading and falling apart.” Patterson says that zombies on *The Walking Dead*, “serve as a commentary to how humans react when society breaks down. That’s always the fear in the back of our minds. When society fails us, when the government fails us, how will we react? Will we help each other?”

Film: *Train to Busan*—Social Relevance

This saying, the South Korean movie, *Train to Busan*, reflects on the present-day reality of South Korea, where many citizens feel elites are not helping the society during political crisis. Thus, Koreans have to protect themselves from political chaos. South Koreans connect this film to the tragedy in 2014 where 300 people, mostly teenagers, died when a ferry overturned in the sea. In the beginning of the ferry incident, government, media, and news reported that everyone survived. Knowing that mostly middle schools died in the ferry created a national trauma. There were forged messages, which showed the last conversation between the kids who sank in the ferry with their families, perhaps to gain public attention and to collectively grieve. Days after the ferry sank, the government took action to “rescue” people that were stuck inside the ferry, which caused huge anger from South Koreans because of their lack of immediate action. One of the most popular Korean film magazines, *Cine21*, reviewed “train” is “motivated by sadness and anger over a situation where the weak cannot be protected.” Perhaps, the “train” represents innocent citizens of South Korea who are defending themselves against the government. In the

film, the senior employee of the train company, who tries to save only himself, represents the ferry captain and crew who got into lifeboats without rescuing passengers. Survivors on the boat stated that the crew made an announcement to stay calm, while the crew and the head captain left their utmost responsibility to save every passenger. After this incident, the principal of the school committed suicide and the trial for the captain and the crew was a national drama.

Study of College Students in Response to Bloody films and Violent Documentaries

A psychological study was done to determine why college students would choose and pay to watch bloody fiction films more than violent documentaries. This study explains by knowing horror movies are imaginary the students are more relieved and less disturbed. Dr. Glenn Walters explains this psychological research to explain tension (suspense and shock), relevance (relates to us personally), and unrealism (fictional story) are the main factors why we horror films captivates us:

Haidt, McCauley, and Rozin (1994), in conducting research on disgust, exposed college students to three documentary videos depicting real-life horrors. One clip showed cows being stunned, killed, and butchered in a slaughterhouse; a second clip pictured a live monkey being struck in the head with a hammer, having its skull cracked opened, and its brain served as dessert; a third clip depicted a child's facial skin being turned inside out in preparation for surgery. Ninety percent of the students turned the video off before it reached the end. Even the majority of individuals who watched the tape in its entirety found the images disturbing. Yet many of these same individuals would think nothing of paying money to attend the premiere of a new horror film with much more blood and gore than was present in the documentaries that most of them found repugnant. McCauley (1998) posed the logical question of why these students found the

documentary film so unpleasant when most had sat through horror pictures that were appreciably more violent and bloody. The answer that McCauley came up with was that the fictional nature of horror films affords viewers a sense of control by placing psychological distance between them and the violent acts they have witnessed. Most people who view horror movies understand that the filmed events are unreal, which furnishes them with psychological distance from the horror portrayed in the film. In fact, there is evidence that young viewers who perceive greater realism in horror films are more negatively affected by their exposure to horror films than viewers who perceive the film as unreal (Hoekstra, Harris, & Helmick, 1999).

Four Viewing Motivations for Graphic Horror

According to Dr. Deirdre Johnston (1995) study “Adolescents’ Motivations for Viewing Graphic Horror” of *Human Communication Research* there are four different main reasons for viewing graphic horror. From the study of a small sample of 220 American adolescents who like watching horror movies, Dr. Johnston reported that: “The four viewing motivations are found to be related to viewers’ cognitive and affective responses to horror films, as well as viewers’ tendency to identify with either the killers or victims in these films.” Dr. Johnson notes that:

1) gore watchers typically had low empathy, high sensation seeking, and (among males only) a strong identification with the killer, 2) thrill watchers typically had both high empathy and sensation seeking, identified themselves more with the victims, and liked the suspense of the film, 3) independent watchers typically had a high empathy for the victim along with a high positive effect for overcoming fear, and 4) problem watchers typically had high empathy for the victim but were

characterized by negative effect (particularly a sense of helplessness).

Conclusion

Watching a horror film makes us feel safer and reassured more than a bloody documentary because we know that the plot, setting, and characters are unreal. Documentaries are real and truth is scarier than fiction. Therefore, watching a documentary or even a horror film based on a real story gives us constant reminder that it happened to someone and can happen to us too.

The satisfaction at the end of the horror film makes it addicting to watch. During the movie, our body freezes and muscles tense because of quick-paced scenes that makes us vigilant of the upcoming, unexpected turn of events. But the moment we relax our muscles and come back to reality, we are pleased.

Chapter 2: Mise-en-scène in Horror Films

Overview

The thought of watching a horror film makes some people cringe. Knowing that horror film directors use images and sounds to get through the audience's consciousness, some of us remind ourselves the movie is not real. But as soon as the movie begins, we become so absorbed by the plot we forget that we are in the theater. For some of us, as much as we remind ourselves we should not scream, we uncontrollably gasp or yelp. We know characters in film are not real, but the whole mise-en-scène; the acting, makeup, costume, setting provide such a real experience. So why do we get scared when we know horror movies are not real?

Lighting Techniques in Horror Films

Different types of horror lighting—uplighting, silhouette, spotlighting, underexposure, harsh light (hard light, chiaroscuro), prominent and projected shadows, shooting through objects (internal frames)—can distort images to create mystery, tension, and suspense. Uplighting creates alarming shadows around eyes and facial features, which gives an eerie appearance. Perhaps, that is why kids hold their flashlights under their chins while telling scary stories around a campfire. Furthermore, light from below looks unnatural since sunlight shines on us from side, above, and from behind. This lighting that comes from beneath evokes the idea that it is coming from hell. On the other hand, light coming above makes it seem it is coming from heaven, which gives a celestial, angelic halo effect. Spotlighting, underexposing, chiaroscuro, and shooting through objects make viewers feel suspense because these techniques conceal some of the images. Our brains begin to imagine the full, clear image without the shadows and imagine those darker places conceal horrific things.

Silhouettes hide some of the physical appearance of the characters and produce a distortion of reality along with uplighting and prominent shadows. In the article, “Shadows in Horror Films: Fear of the Unknown,” Brogan O’Callaghan (2017) explains:

Filmmakers frequently use shadows because the human imagination conjures up what is most terrifying to each person. This is an intelligent method because if they had to create a monster, they would be isolating the audience that isn’t scared by that monster. It is a simple, yet high effective way to evoke fear.

Noir lighting gives a sense of mystery by its harsh light that shines on the face. The director or special effects designer can shine a light or slight movement of the shadow, without the audience knowing. By skimming the harsh light across the face, the audience may release tension through different emotions.



Uplighting (lighting from below also chiaroscuro effect) from *Frankenstein* (1931)



Silhouette from *Double Indemnity* (1944)



Spotlighting from *Marnie* (1964)



Underexposure from *Zodiac* (2007)

Cinematography

Cinematography in horror films often incorporates perspective shots, tracking shots, wide shots, and extreme close-ups. Filmmakers also use distorted shots shooting through objects,

hand-held camera shots to suggest shakey subjectivity, and foggy texture to give unworldly suspense.

Close-ups on character faces can make the audience relate to the protagonist's terror and emotions. But in many horror films, filmmakers may capture an extreme close-up shot on a specific facial feature—especially eyes—to express emotions without words. Unlike medium close-up shots—usually covering character's head and shoulder—extreme close-ups invade the character's intimate space. The extreme close-up shot fills the whole screen, which emphasizes the dramatic importance of the scene by intensifying the emotion the character is feeling and allows us to feel sympathy. For example, in the beginning of the movie, an extreme close-up of an eye sends a message to the audience that the film will reveal different journeys of the mysterious world. By zooming into an eye from a close-up shot to an extreme shot can serve as a narrative purpose by implying we are watching through the character's perspective. In zombie movies, if there is an extreme close-up of a bloody eye, or an unusual colored eye, we can tell there is a deadly virus. In other horror movies, an extreme close-up of the protagonist's eyes can reflect terror.

Shooting a character through an object gives the feeling of being “watched” and is unsettling. High angle shots can make the protagonist looked down to make them viewed as vulnerable. Low angle shots can make the antagonist look powerful while the protagonist looking up seems inferior, childlike, and helpless. Tracking or panning shots can make the character look as if she is being followed or watched, creating suspense in the viewers because we do not know if something may endanger the protagonist. Extreme long shots or wide shots give viewers an idea that a setting is isolated and deserted, creating an uneasy sense for the protagonist's safety. To add more sense of reality, horror films use hand held camera shots to

make the audience feel as if they are in the character's shoes. Thus, over-the-shoulder shots gives the feeling the villain is standing and following the protagonist. Tilted angles can demonstrate dramatic tension by using the camera and portraying a world out of balance. Foggy textures from fog machines set a mysterious and a cold tone to the scene.



Extreme close-up from *The Texas Chain Saw Massacre* (1974)



High angle shot from *The Shining* (1980)



Low angle shot from *Citizen Kane* (1941)



Tracking/ panning shot from *The Shining* (1980)



Wide-shot from *The Shining* (1980)



Hand-held camera from *REC* (2007)



Point of view shot from *Psycho* (1960)



Tilted Angle (Dutch Angle) from *The Third Man* (1949)



Foggy scene from *The Exorcist* (1973)

Editing

Editing, the juxtaposition and rearrangement of sounds and images to create new perceived meanings, is a unique component of film expression.

In chapter, “Rhythm and Moving Shots,” from the novel, *The Aesthetics and Psychology of Cinema*, by Jean Mitry, highlights the cuts, movements, and placement of shots. The author further states, “with so much covering material to hand, the editor has considerable freedom of choice. He can construct the film as he wishes” (Mitry, 1997, p. 175). Indeed, there are so many different shots, such as long continuous shot, wide shot, close up, point-of-view... and as much as there are various types of shots, there are limitless ways to edit these pieces together. This gives the editor freedom to put shots together and the position of edits can demonstrate how the editor wants the audience to view the film. This meaning, the editor positions each shot intentionally to move the audience to feel a specific way. By putting shots together, this is a “premeditated intention,” to provide sense of continuity, according to its angle, framing, or movement” (Mitry, 1997, p. 176). Not only editing is calculated in different places, but shooting each scene is planned too.

Television shows such as *Criminal Minds*, *NCIS*, *Mindhunter*, *Lie to Me*...are forensic television shows that capture the criminals in a psychological way. Television shows such as *Criminal Minds* and *NCIS*, typically start with fast, short, quick-paced shots of victim’s murder. For instance, the show may start off with short montages of random body parts, including: wide shot of the victim’s place of murder, then close ups of the victim’s body, next extreme close ups of the victim’s nails, fingers, and stab wounds. These short clips are shot in various angles and edited together. The quick pace scene in the beginning of the movie grabs the attention of the audience by shocking the viewers of the gruesome images.

As the Jean Mitry states, “each shot presupposes one angle alone which fulfills an internal need...and each shot has its own natural necessary context which gives it its meaning and justification” (Mitry, 1997, p. 176). *Criminal Minds* and *NCIS*, both have a similar editing and storytelling method. In the beginning of every episode, both shows give multiple shots of the victim’s death, specifically, the details of wounds on the victims. These shots are intentionally placed in the beginning of the episodes because as the show goes on, the plot finally reveals how the victim got the wounds. Finally in the end, when the show reveals how the victim dies, the story edits to photos of the victim’s death that was displayed in the start of the episode.

Martin Marcel writes, “juxtaposition, through editing, of two images whose confrontation is bound to produce in the audience’s minds a psychological shock whose purpose is to facilitate the perception and assimilation of an idea which the filmmaker wishes to express through the film” (Mitry, 1997, p. 179). Marcel explains two shots have symbolic effect on other shots. Moreover he says the psychological shock by the audience is the filmmaker’s purpose intention. If the intention of the filmmaker is for the audience to be in shock, then it explains the filmmaker achieved his goal.

The juxtaposition of two shots A and B (crime photos of victim’s death) leads to the significance of the outcome, X (Mitry, 1997, p. 176). If shot A of the victim standing on top of the building (wide shot) is juxtaposed with shot B, the girl on the floor bleeding (close up), this implies outcome X, that she fell of the building. Although there is no actual scene that shows the girl jumping down the building, through the process of editing implies, by association of suicide.

Furthermore, the juxtaposition of shots of the victim in the beginning suggests to the audience: “how do you think the victim was killed? What kind of psychological problem do you think the murder has?” For example, shots in the beginning show the victim is lying down

peacefully on the grass with her arms folded to her chest. The audience wonders why a killer would take the time to pose the victim, especially in a peaceful pose. Later on, the murderer reveals he is a sympathetic person as the reason why he crosses the victim's arm and kills because he does not want the victims to suffer. For the murderer, killing is a way to end victim's depression and constant thoughts of suicide. Thus, the murderer thinks of himself as a saint by doing a good deed.

Kuleshov Effect

Soviet filmmaker Lev Kuleshov demonstrated the Kuleshov effect, which is a style of editing that manipulates space and time. Same exact shots can express a different meaning depending on the next shot in the montage. This mental phenomenon can be explained from facial expression, which is essential to understanding mental and emotional states of people. The same shot of the actor's facial expression can change our interpretation of the actor's intentions and the overall context of the plot. For instance, this phenomenon is widely demonstrated in Kuleshov's experiment of different montages of the shot of Ivan Mosjoukine. The first shot of the actor is displayed then cuts to a plate of the soup, then same shot of the actor cuts to a girl in a coffin, finally the same shot of the actor cuts to a woman. The picture of Mosjoukine was the same shot for all three cases.



The audience believed that Mosjoukine's facial expression was different every time it alternated with other shots. Depending on the shots that were alternating, the shot of the actor looking at the soup, girl in coffin, and woman showed the actor was hungry, grief-stricken, and lustful, respectively.

Gestalt Theory

The Gestalt psychology is a theory that states our human mind is holistic and has self-organizing tendencies, which our human eyes sees objects in its entirety than perceiving their individual parts. So in other words, our brain visually rearranges things to make sense. Gestalt theory explains our capability to visually recognize whole figures and not just lines and curves and by productive thinking we examine until we reach the moment of cognition. This theory connects to film studies by portraying the "whole is greater than sum of its parts." For example, if a scene portrays a girl on top of the building and the next scene that cuts to the girl lying on the street, we automatically conclude the girl fell from the building. We did not see her falling, but according to Gestalt psychology our minds fill in the missing information, thus editing and montage gives this psychological experience.

Costumes, Props, and Makeup

Costumes and makeup in horror films are important to give a frightening image of the antagonist. From the movie, *It* by Stephen King, Pennywise the clown gives an uneasy aura. A term for people who are scared of clowns is coulrophobia and excessive fear of clowns can cause panic, palpitations, difficult breathing, and nausea. However, those who do not have this phobia can still be terrified by the visual appearance. Perhaps clowns have the capacity to provoke fear because their make-up conceals their true facial emotions, thus preventing our instinctual desire to read other people's minds through their faces. Clowns are pranksters who are mischievous, so right away we are on alert because their unpredictable nature can bring bad consequences. *The Purge*, a film by James DeMonaco, the characters wear masks to conceal their faces. These masks, faces of men and women smiling widely with large, white teeth portray the uncanny valley effect, where things appear to look almost very human but are not fully right and are thus unsettling. This phenomenon also explains why humans find dolls scary as in the movie, *Annabelle*.

In many South Korean horror movies, virgin ghosts or teenage/young adult ghosts are more popular than Vampires. Because of cultural myths and beliefs in South Korean society, long, white mourning clothes and school uniforms are one of the most common costumes in horror movies. Most Korean ghosts—Cheonyeo Gwishin—are female and called “virgin ghosts” because they died when they were single, which was a disgrace in patriarchal Korean society. Usually, in movies “virgin ghosts” are very pale, have long, black hair, and wear white traditional mourning clothes that cover their entire body. This depiction of “virgin ghosts” is also a portrayal of South Korean women in general because South Korean women are born mostly pale and have naturally black hair. Female student ghosts are also popular in South Korean

horror stories and movies. Due to the competitive society, many students are pressured to excel in their studies and due to high stress and some students commit suicide. These students come back as ghosts wearing their school uniforms since all students in Korea wear uniforms in middle school and high school. Dead students come haunt their enemies, usually their classmates by roaming around the school and by killing students one by one.

Props in horror movies are the “instruments of terror” and essential to the storylines. This saying if there were no Ouija board in *Ouija*, no chainsaw in *Texas Chain Massacre*, no television in *The Ring*, or no bible, or crucifix in *The Exorcist*, there would be no horrifying plot. A man chasing children with his bare hands is somewhat less frightening than if he holds a chainsaw.

Make-up is also an essential feature in horror genres to create appalling and gruesome effects. Make-up SFX artists, who use special make-up effects and FX prosthesis, are responsible for transforming actors into horrifying monsters and creatures such as: Frankenstein, Dracula, ghosts, and lesions of zombies. Special effects make-up artists in the entertainment industry apply prosthetics, cosmetics, fake blood, and even tissues to create the appearance of bruises, cuts, blood, wrinkles, deformities, and mutations. SFX makeup artists can create different ghastly, bloody scenes without the use of editing and visual effects, for example the notorious “throat slash” scene where a character slashes another character’s throat and blood pours out. The SFX make-up artist creates “the blood delivery system” then glues and paint the foam latex throat appliance that looks like realistic layers of skin. Excessive blending of make-up is perfected to make the appliance the same skin tone with the actor’s skin.



Clown from *It* (2017)



Mask from *The Purge* (2013)



Before and After SFX make-up from *The Walking Dead* (2010)

Setting

Horror films often set in isolated locations such as cabins, forests, mountains, deserts, abandoned ships and houses. These lonely or enclosed spaces, contrasting to wide-opened spaces, give a tense atmosphere because of the idea that no one can help you when you are in

isolation. Settings such as forests, mountains, deserts, and wide-open areas give feelings of uneasiness because viewers do not know what will pop out and attack the character. Scary films usually take place during the night and forests and mountains have a lot of trees that cover the area. Trees and absence of light give a limited view of the area and is perfect for jump-scares, a technique used commonly in horror films by surprising the audience with an abrupt change in image or event, usually occurring with a loud, frightening sound. Moreover, abandoned houses or buildings suggest feelings of hopelessness because they offer few avenues of escape.

Acting

Acting in horror films requires wide range of facial expressions and body language to evoke fear and make the audience sympathetic to victims. Horror film actors exaggerate facial and bodily expression not only to portray different emotions like fear, shock, nervousness, desperation, and tension, but also as a narrative strategy. For example, in zombie movies, when a character is bitten by an infectious zombie they shake, roll their eyes, open their mouths wide, and distort their body in different angles the character wants to show that they are transitioning to a monster.

Sounds and Music Patterns

From Xiangyi Fu thesis on “Horror Movie Aesthetics,” Fu states, “Professor, Michael J. Epstein, in Northeastern University identifies four main categories of music in horror movies to evoke physiological response: dissonance and unnaturalness; the dynamics of loudness, speed, and pitch; uncertainty, whispered voices, silence; and startle reflex.” Dissonant chord sounds (like a child’s cry) are widely played in horror films such as *The Shining*. These sounds immediately make the audience uncomfortable while the dynamics of loudness, speed, and pitch in horror movies also create tension. Whispered voices in horror films can suggest uneasiness.

When characters whisper to each other viewers worry the antagonists might hear them. Other whispered voices like children singing nursery rhymes in a slow, low volume express children's innocence distorted. We expect children singing with energy and spirit, but if they are singing quietly and monotonically, we fear the children as possessed, which gives a chilling feeling.

Reflex technique creates a sudden noise to make the audience jump. Neuroscientist and author of *The Universal Sense: How Hearing Shapes the Mind*, Seth Horowitz states, "a sudden loud noise activates a very specialized circuit from your ear to spinal neurons. It's the 'Startle Circuit.' If you suddenly hear a noise, within 50 milliseconds your body jumps and begins to release adrenaline, with no consciousness involved. It's five neurons." Music can build up as in *Jaws*, when the shark is about to appear, but when the sound reaches its climax, there is a silence, and then suddenly we hear a loud noise and jump. Study says that the suspense-building chords in *Jaws* are irregular minor chords that trigger the same instinctual response a mama marmot feels when her babies are threatened.

Blumstein Study on Nonlinear Noise

While studying yellow-bellied marmots in Colorado, an expert scientist on animal distress calls, Daniel Blumstein (2010), noticed that baby marmots often screamed when researchers caught them. These screams are classified as "nonlinear chaotic noise." And while studying sounds in horror film, Blumstein discovered the horror film, *The Shining*, used recording of animal screams. Blumstein (2010) study, published in the journal *Biology Letters*, also states that such nonlinear sounds, like a child's cry, trigger a biologically ingrained response by making us think our child is threatened.

Blumstein, Byrant, and Kaye's (2012) research finds that film soundtracks from different genres contain different sounds. Blumstein, film score composer Peter Kaye and

communications professor Greg Byrant designed different music samples—one set of music meant to be emotionally neutral that had neither noise nor abrupt frequency transitions and another set of music that used “distorted” nonlinear elements. The researchers designed two experiments for undergraduates to determine specifically how stimulated nonlinearities in soundtracks influence perceptions of arousal (how emotionally stimulating) and valence (how happy or sad). Greg and Peter composed 10-second clips of neutral music and then changed the music after 5 seconds by including rapid frequency changes. When asked to rate the music segments based on how emotionally stimulating they were and what kind of emotion they evoked, participants ranked the music with nonlinear elements more stimulating and linked it to strongly negative emotions such as fear. Blumstein, Byrant, and Kaye (2012) indicate that, “musical clips where the melodies suddenly became higher provoked greater emotional stimulation than moments where the notes suddenly went lower.” Blumstein believes this is why “a marmot’s scream goes higher when the marmot’s vocal cords go tenser, and this tensening would likely occur when the animal is scared.” In the second experiment, participants were asked to watch objectively boring videos like drinking or reading a book, paired with nonlinear music. Participants found the same distorted music less scary when watching a boring video. Blumstein’s research concludes that visual stimuli distracted participants in some way reducing the effectiveness of the simulated nonlinearities to evoke emotional response.

Furthermore, according to Blumstein, Byrant, and Kaye (2012), “music with rapid frequency were more rousing and music with noise and upward frequency shifts were perceived as sadder or more frightening.” Music significantly contributes to our emotions: minor chords evoke sadness and increase in volume and rapid tempos are arousing. Blumstein states, “for horror films, there were more screams and noise, for sad, dramatic scenes in dramas, there were

more above-frequency transitions such as violin notes changing very quickly.” Other findings Blumstein discovered in other movie genres are that dramas used more music in the foreground that imitate subharmonic sounds that fit the nonlinear pattern. Also in war or adventure films there are no significant nonlinear patterns. So next time if there is a scary scene, turn off the music!

Sound Techniques Used in Films

Sound designers use different sound effects such as animal cries to express fear and distress to the audience. Animal cries terrify our primitive parts of our brain and thus sound designers use abrupt frequency shifts of chaotic and non-linear sounds to manipulate our emotional response. The abrupt amplitude fluctuation heightens the intensity of moments of horror. According to the article “Why Calls of the Wild Are the Secret of a Good Horror Film,” by science editor Steve Connor, he gives examples of films that use suspense-building music to mimic sounds of animals in distress. In the classic film, *King Kong* (1933), scientists say that they first used recorded animal sounds to produce non-linear sounds. Likewise, in *The Exorcist* (1973) editors threw box or rats onto the wall to produce scratching sound effects for the film. Director Alfred Hitchcock used a trauttonium, an electronic instrument in the film *The Birds* (1963), to create a horrifying avian language rather than using recorded bird calls. In the famous shower scene in *Psycho* (1960), used violin combinations by retaining tension in the slower portions through ostinato. The screeching violin sequences that produce high-pitched strains cause the film’s most intense scene. When the protagonist screams, the violin’s high pitch resembles a bird’s shrill call and intensifies the sound of the knife going through her skin. Therefore, the sound also makes the visualizing part of the scene more horrifying.

The 20th Century composer, Krysztof Penderecki creates music pieces in numerous films: Stanley Kubrick's *The Shining*, Martin Scorsese's *Shutter Island*, William Friedkin's *The Exorcist*, and David Lynch's *Inland Empire*. Krysztof Penderecki's terrifying music is perfect to promote terror in their movies. Krysztof Penderecki's musical piece Polymorphia, is used in both *The Shining* and *The Exorcist* where both terrifying screaming sounds are followed by quieter sections.

Conclusion

Cinematography, sound design, misè-en-scene, editing, and other film crafts help create a successful, scary story. Every part of the film is deliberately crafted to evoke specific feelings and telegraph emotional responses to the audiences. There are so many different techniques and designs to mix and match, which gives every film its own distinctive storyline.

Chapter 3: Science Behind Horror Films

Overview

Our primary instincts explain why we are afraid of certain images such as snakes due to our innate fear of being eaten. This explains why many horror filmmakers use monstrous animals in movies. Other fear responses such as physiological response and brain activity further reveal what happens to our body when we watch a scary movie and why these responses make us react in a certain way when we are afraid. Other studies of the newly emerged science called neurocinema, show that different parts of the brain are activated while watching films.

Physiological Responses

We choose to watch horror movies even if we know they can be violent, bloody, and gruesome. People are attracted to the eerie music in the background and enjoy the thrill as the music heightens when the character is in danger. In general, our adrenaline rushes because of the excitement and fear of anticipating when a killer strikes in the movie. By also recalling the physiological arousal when our blood pressure, respiration, and heart rate increases after the movie ends—tension is released. We come out of the movie theater and criticize that it's a “bad movie” if it was not “scary enough” because we enjoy as our muscles become tense and our palms become sweaty.

The reaction to what we see on the screen is not limited to the brain but extends throughout the body. The brain sends an alarm signal activating the autonomic nervous system by increasing the production of cortisol and adrenaline, two neurotransmitters that cause some changes at the physiological level.

Bos, Jentgens, Beckers, and Kindt (2013) study by researchers at the University of

Amsterdam found that in these movies music generates what is known as “alarm reaction,” a simultaneous response of mind and body to a sudden and unexpected stimulus that leads to contraction of the muscles of arms and legs. That is why when watching a horror movie we always tense our muscles. Mian, Rayner, Harkin, and Williams (2003) study conducted on a group of young people revealed that watching a horror movie causes an increase of 14 beats per minute of the heart rate. It was also found a significant increase in blood pressure. In addition, researchers found an increase in white blood cells in the blood and a higher concentration of hematocrit, as if the body were to defend against an intruder. Lastly, a common response from your body is sweating when you are scared. Barry and Bruggemann (2002) study at University of Wollongong have analyzed the response of a group of people in front of violent and horror movies and noticed how those who are more empathic tend to sweat more when watching these movies, and show no signs of addiction.

Positive Feelings by Dopamine Chemicals

The audience understands they are in a safe environment while they watch a scary movie. According to Concordia University Saint Paul, “horror entertainment can trigger the fight-or-flight response, which comes with a boost in adrenaline, endorphins and dopamine while viewers are in a safe place. The brain can process surroundings and conclude that the experience is not a true threat.” Sociologist Margee Kerr told *The Atlantic*, “After the physical reactions associated with fear wear off—faster rate and breathing, muscle tension and other involuntary responses—they are replaced with intense relief. Positive feelings intensify and in, short fear floods our brains with feel-good chemicals.”

Furthermore, David Zald, a professor of psychiatry and psychology at Vanderbilt University, observes “humans have a unique situation where we will seek out things that scare

us. We've got to ask, what could make this exposure rewarding?" Professor Zald's research on chemical dopamine suggests that "chemical in the brain associated with pleasure and rewards give us sense of satisfaction when you complete a task." Everyone is different in thrill-seekers and thrill-avoiders, but Dr. Zald states, those with higher tolerance to risk have less autoreceptors and more dopamine and for thrill-avoiders they have more autoreceptors and less dopamine. From this research by Dr. Zald, we can conclude that those who enjoy watching scary movies have higher tolerance for risk and thus are more satisfied.

Atavistic Response to Animals and Fear Responses in Brain

Many themes in horror classics such as *The Rats*, *Cujo*, *King Kong*, and *Jaws* portray humans running away from these monstrous animals because they are at risk of being eaten. Through evolutionary theory and research, we can understand that being captured by a carnivorous predator is an innate fear and that is why some filmmakers use monsters of animals to make people afraid.

Science writer, David Quammen says, "among the earliest forms of human self-awareness was the awareness of being meat." This saying, our ancestor's greatest fear was that they might be the prey. This emotion of being constantly anxious and afraid during the dark can be due to our self-defense to protect ourselves during a vulnerable situation.

Cook, Hodes, and Lang (1986) study used loud noises to condition people to fear the sight of snakes and guns. They found that people acquired a fear of the snakes much more easily even though the noises matched the sound made by guns. Most people pay more attention to animals than to other people. Study from New of Barnard College in New York, says, "our brains keeps monitoring a living creature probably because, unlike, a bridge or a building, a person or animal can suddenly turn from friendly to hostile.

Masataka, Hayakawa, and Kawai (2010) research included participants of all ages (3 year-olds, 4 year-olds, and adults) to spot pictures of snakes or flowers. All of the participants were significantly quicker at the task when spotting a snake among flowers than when spotting a flower among snakes. In addition, participants were quicker to point out a snake if they were in a striking pose—body coiled, the neck held in a s-curve and the head poised to strike. The reaction time for snakes in a striking pose was 2452ms compared with 2519ms when snakes were in a resting position. In other words, even the youngest children, aged three, are sensitive to any threat-like figure, in this case the snake posture. The researchers explained, “when a striking posture is taken by snakes, they display their specific morphological characteristics as signals toward the presumptive signal receivers so that the receivers will categorize them as snakes as efficiently as possible, be threatened and withdraw.”

Koch et al. (2001) study indicates, “individual brain cells that respond when a person sees an animal, but not when that person sees another person, a place, or an object” and these cells were found in amygdala. Koch et al. (2001) demonstrated that the right amygdala, a brain region involved in fear learning, responds more vigorously to the sight of animals, including spiders, dogs, and rodents, than to other pictures of human and objects. One theory why we have these cells to help the brain to respond quickly to danger because, animals had posed a threat to our ancestors.

However, Thomas Straube (2010) brain scan research found that, scary movies do not activate fear responses in the amygdala. Instead, other parts of the brain that were firing were the visual cortex—the part of the brain responsible for processing visual information, the insular cortex—self awareness, the thalamus—determines where incoming sensory data should be sent in the body, and the dorsal-medial prefrontal cortex—the part of the brain associated with

planning, attention, and problem solving.

So if Straube's research explains that amygdala does not do anything in response to fear, then why do the negative emotions and distressing feelings often linger even after watching horror movie?

Other studies determined that the hippocampus, which stores and retrieves memories and process stimuli to give context, and hypothalamus, which activates the fight-or-flight response, give a chain reaction causing fear in our brain.

Michael Grabowski, an associate professor of communication at Manhattan College and the editor of the textbook, *Neuroscience and Media: New Understandings and Representations* states, "usually when we're watching something we've shut down the motor regions of the brain, and yet those stimuli [from a shocking scene] are so strong that they overcome the inhibition to the motor system." In other words, because we are in the theater relaxed and only our awareness is active, "we jump and yell because a film bypasses our tranquilized state and taps into a primal instinct, which is to react immediately to protect ourselves and warn others — before taking time to process what scared us." Grabowski also explains, "the scream is a way to alert others in your social group and scare off attackers." Our reactions and emotions from a scary scene happen first before we actually realize it was not real. Scenes can give such an emotional impact that we, as an audience, react immediately protecting ourselves and others. We scream not only out of pure reaction but also to warn others instinctively that there is danger and we must protect ourselves. This idea of primitive reaction in our brain demonstrates atavism, which describes our innate nature to respond to threat by possessing traits from our remote ancestors than our own parents. Due to the fact, that screaming comes before we process that the scene is scary, we know our body reacts before anything.

Three Stages of Fear

The article, “What Happens In Our Brains When We Get Scared,” Abigail Marsh, professor of psychology at Georgetown university talks about how fear triggers a signal in your brain. She states:

The signal travels to the amygdala—a region near the base of the brain. The amygdala fires a brain chemical called glutamate out into two regions of the brain. The first region makes us freeze or involuntarily jump. These reactions are so automatic because the signal is sent deep into the base of the brain to an area that we have little control over. The second signal is sent to the hypothalamus and triggers our autonomic nervous system — the system responsible for the fight or flight instinct — when our bodies go into superman mode. It elevates our heart rate and blood pressure and pumps adrenaline throughout our bodies. That's the rush you feel when scared. (2013).

Based on the interview with Prof. Marsh we first freeze—evolutionary response to keep us hidden from predators, run away—adrenaline helps us to run away quickly, and fight—if we cannot run away any longer, the same adrenaline will help us fight off. After we jump in a scary scene, how brain realizes the threat is not real and the parasympathetic nervous system calms us down.

Emerging of Neurocinematics

Quoted from Donald Spoto’s (1983) biography of the filmmaker, Alfred Hitchcock reportedly told scriptwriter Ernest Lehman:

The audience is like a giant organ that you and I are playing, at one moment we play this note, and get this reaction, and then we play that chord and they react. And someday we won't even have to make a movie — there'll be electrodes implanted in their brains, as we'll just press different buttons and they'll go 'ooh' and 'aah' and we'll frighten them, and make them laugh. Won't that be wonderful?

From an emerging field called, “neurocinematics,” which focuses on the connection between the mind and the experience of cinema, neuroscientists find filmmakers are consistently able to trigger similar emotional reactions in viewers, especially with scary movies. As Hitchcock said the more we understand the connection with our reactions and scary visual scenes, it is easier filmmakers can have the control to manipulate audiences’ emotions and reactions however they want.

Studies of neurocinema are done by participants watching movies monitored in fMRI (functional Magnetic Resonance Imaging) machines that map the brain’s activity. When researchers told the participants they can look where ever they wanted to—free-viewing—and stop the study whenever, results showed that all participants had similar eye movement and stimulation in areas of the brain while watching certain movies.

fMRI Reconstructing Images From Our Brain

In Berkeley News, “Scientists Use Brain Imaging To Reveal The Movies In Our Mind,” UC Berkeley researchers, Jack Gallant and Shinji Nishimoto, have achieved to decode viewer’s visual experiences using fMRI. Research team members volunteered to be subjects for the experiment by watching two different Hollywood movie trailers inside the MRI scanner for hours. In this experiment, “while fMRI was used to measure blood flow through the visual cortex, the part of the brain that processes visual information.” On the computer, the brain was

divided into small, three-dimensional cubes known as volumetric pixels, or “voxels.” When viewers are watching certain images, the voxel demonstrates how these images in the movie are mapped into brain activity. Clips of the movie are reconstructed through brain imaging and computer stimulation by “associating visual patterns in the movie with the corresponding brain activity.” However, these reconstructions are blurry and are hard to make because researchers say, “blood flow signals measured using fMRI change much more slowly than the neural signals that encode dynamic information in movies.” Psychology and neuroscience professor, Jack Gallant explains in an interview that primary visual cortex responds to the local features of the movie such as edges, colors, motion, and texture but this part of the brain cannot understand the objects in the movie. In addition, movies that show people are reconstructed with better accuracy than abstract images.

Using Neuroimaging For Entertainment Success

Can brain scans predict movie success in the box office? Two marketing researchers from the Rotterdam School of Management devised an experiment by using EEG on participants. EEG demonstrated that individual choice and box office success correlate with different types of brain activity. From article, “How Neuroimaging Can Save The Entertainment Industry Millions of Dollars,” it states, “individual choice is predicted best by high frontocentral beta activity, the choice of the general population is predicted by frontal gamma activity.” Perhaps, with quickly advanced technology, predicting movie genre and plots that can hit the box office could be successful.

Neurocinema in Hollywood

One strategy that helps filmmakers, producers, and distributors to achieve global market success is by using fMRI and EEG to make a better storyline, characters, sound effects, and other

elements in film. Uri Hasson, a Princeton University psychology professor, experimented with different film genres, and certain films like horror, action, and sci-fi showed high activation scores in the amygdala part of the viewer's brains. Horror filmmakers can control audience's brains by manipulating the amygdala by editing films to provoke maximum stimulation in this region. Based on article, "Rise of Neurocinema: How Hollywood Studios Harness Your Brainwaves to Win Oscars," for big-budget films many filmmakers go on a neuromarketing trailer testing by using "EEG and biometric techniques to measure and record viewer brain responses to different trailer scenes and sequences." According to *MindSign*, big mainstream film corporations like Dreamworks and Sony own few fMRI machines that are used in the neuromarketing field.

Benefits of Brain Scans for Filmmakers

According to article from CNN, "Brain Scans Gauge Horror Flick Fear Factor," film producer Peter Katz and researchers at functional MRI research facility *MindSign* Neuromarketing, in San Diego, California worked together to scan brain activity to determine the degree of fright caused by certain scenes from the horror film, *Pop Skull*.

The purpose of this research was to measure the brain response in the amygdala because this part of the region is the most sensitive to emotions when watching a horror film. The participant was a 24 year-old female, who watched two scenes of the movie—first sessions lasted 48 seconds and second session lasted 68 seconds—while lying inside a Siemens 3T MRI scanner. The participant had a 20 second break in between scenes to readjust her eyes to center. During scary parts, the amygdala part of the brain lit up when the participant felt fear during a particular moment.

Furthermore, the article explains that the brain scans help filmmakers accurately know

which scenes viewers liked or did not like. Before brain scans, the viewers were asked to fill out a questionnaire to measure how they felt during certain scenes. But after watching the movie, most people had a hard time recalling scenes and describing their emotions. Therefore brain scans helped filmmakers understand audiences' minds by able to locating different responses during any time.

In addition, Oscar-winning director James Cameron speaks about the advantages of fMRI in films. Filmmaker Cameron, says in the magazine, *Variety* that “a functional-MRI study of brain activity would show that more neurons are actively engaged in processing a 3-D movie than the same film seen in 2-D.”

Filmmaker Peter Katz's and Dr. David Hubbard's Interview on fMRI

During an interview with magazine *Wired*, filmmakers Peter Katz and Dr. David Hubbard explain how fMRI makes movies become more innovative. Peter Katz explains in *Wired*, “the filmmakers will be able to track precisely which sequences/scenes excite, emotionally engage or lose the viewer's interest based on what regions of the brain are activated. From that info the director can edit, re-shoot an actor's bad performance....and apply changes to improve or replace the least compelling scenes.” Dr. Hubbard explains fMRI can show audience's subconscious mind even without the audience knowing how they feel. Test screenings in fMRI records how the participants are subconsciously reacting and determine exactly what specific images invoke an emotional response or does not invoke a certain response.

Conclusion

With advanced technology, fMRIs not only help filmmakers know which specific scenes interest the audience, but also to what degree the audience is engaging in certain scenes. Neurocinema is a relatively new field and if we can already measure people's responses to

movies, films can only improve in the future. But, if filmmakers are creating films based on science, they are not creating films based on their creativity, so the process of making the film seems too calculated. After all, art does not have to be perfect by using scientific tools to determine what is right and what is wrong. Some people might not enjoy a movie while others might think it is spectacular. Everyone has his or her own tastes because everyone interprets art differently. If filmmakers are too technical in the process of movie making then it may seem they are making movies not out of enjoyment but rather to achieve success.

Brain scans can be time consuming and costly. One person has to lie inside a machine for a lengthy time to reveal his or her brain activity. To have reliable data on what parts of the movie scares or entertains the person, researchers and filmmakers need hundreds of participants. Much money and time are needed for fMRI machines to study multiple individuals. Although, questionnaires can be imprecise they seem to be a more efficient way to show a movie to groups and learn their reactions.

Chapter 4: Dark

Overview

After watching horror films many of us have recurring images of scenes in our heads. Sometimes, even going to the bathroom in the middle of the movie we get nervous. Some of us have similar experiences when we wash our faces and imagine a ghost watching us from the mirror.

Why Scary Movies Can Cause PTSD?

Posttraumatic stress disorder happens when a person suffers anxiety and flashbacks after experiencing or witnessing a traumatic event. After a terrifying event, the person feels helplessness and fearful. Horror movies can create this effect by making the audience feel nervousness especially when the protagonist is being chased or haunted in an isolate, dark place. The emotions the audience experience can cause distress, insomnia, and increase in blood pressure after the movie, especially during the night. After the movie, viewers who are highly distressed might avoid locations that remind them of the movie. For example, if the movie takes place in a mountain or a quiet street, the viewer will either go to these places during the day or avoid these places altogether. If a horror movie spooked the audience then the movie successfully sent its message. However, if a movie embeds scenes in the audience's mind that prevents them from doing certain activities, makes them uneasy for a long period, and have recurrent images of the movie, then the audience may have developed PTSD.

Cinematic Neurosis

Ballon (2007) defines Cinematic Neurosis, "the development of anxiety, somatic responses, dissociation, and even psychotic symptoms after watching a film." *The Exorcist* became a public concern due to many cases of traumatic neurosis by affecting viewers

psychiatrically. Ballon (2007) article, “Horror Films: Tales to Master Terror or Shapers of Trauma,” explains that the viewer will identify and relate with narrative elements in the film by relating to his or her personal life experiences and cultural factors of the movie thus developing stress and trauma. For instance, a case of a 22 year-old woman showed “intrusive thoughts of demonic possession and flashbacks of the film *The Exorcist*.” Also in Ballon (2007) article it mentions after watching the supernatural horror film, *Warlock*, an adolescent “murdered an unsuspecting child—later draining and boiling down the blood and fat from the victim to derive a flying potion” (Pickard, 1996). This behavior was induced after the adolescent watched the horror film.

People who have pre-existing mental health conditions can be vulnerable to developing violent or psychotic symptoms. Vulnerable individuals can have problems with identity issues, anxiety, paranoia, and difficulty in coping stress.

Cases of Cinematic Neurosis

In 1975, psychiatrist James Bozzuto wrote an article, “Cinematic Neurosis Following The Exorcist” for the *Journal of Nervous and Mental Disease*. In this article, Bozzuto reported four cases of people, who did not have any psychiatric illnesses before watching the film and later developed psychiatric troubles after. However, these patients are suspected to vulnerabilities, which led these patients to experience “insomnia, excitability, hyperactivity, irritability, and decreased appetite” after viewing the film. All patients were Christians and they were concerned about losing a family member. Fortunately, after brief psychotherapy for three to seven sessions, all patients were treated for their symptoms.

Another case from Bozzuto’s article states that a 24 year-old black male, Mr. Lyle H., came to the emergency room complaining of flashbacks. In addition, Mr. Lyle was afraid of his

family and believed his 5 year-old daughter was possessed. Mr. Lyle also had insomnia, thought “people looked strange”, lost 15 pounds, and had nightmares—all happened after he watched *The Exorcist*. He showed psychiatric problems thinking everything was done by devils or everyone was a devil.

Hamilton (1978) discussed a case of a young woman who had symptoms of anxiety and fear after watching *The Exorcist*. These symptoms were present right after viewing the film. She was paranoid to be alone at night, refused to go to work, and had her husband with her at all times. Her symptoms worsened when she dreamt of “the Devil with a penis in his mouth.” The patient had a past history of having the fear of losing control and domestic violence. She had a stepfather who drank and repeatedly assaulted her mother. In addition, when she was younger she was beaten by her older sister and witnessed her stepfather almost killing her younger brother. Aside from family trauma and borderline personality structure, she had other nightmares and thoughts of fantasizing harmful acts to herself. With all cumulative traumatic instances from her past and preexisting borderline personality structure, the woman developed a cinematic neurosis that was triggered from her past.

From Robinson and Barnett (1975) case, a 17 year-old girl developed symptoms of anxiety and sleep disturbance after watching *Jaws*. She had no previous psychiatric history but the day after watching the film, she began having episodes of jerking limbs and screamed “shark, sharks!” Psychotherapy was effective and helped treat the patient’s symptoms.

Mathai (1983) demonstrates a case of a 12 year-old boy who became anxious after watching the film, *Body Snatchers*. The boy heard disembodied voices, but hypnotic relaxation and psychotherapy was effective alleviating the symptoms. His family history states his parents were divorced when he was six year-old and his father was an alcoholic and violent. On the other

hand, his mother was hospitalized due to depression and secondary paranoid delusions. The boy's family history and unhealthy relationships with both of his parents may explain his vulnerability to horror films.

Turley and Derdeyn (1990) had a case of a 13 year-old boy whom they described to be "addicted" to horror films. The boy was a fan of the horror series, *A Nightmare on Elm Street* and the therapist and the patient watched film segments and discussed the character's motivations and feelings. Throughout the sessions, the boy realized Freddy's negative emotions was from the loss of his mother, to which the therapist helped the boy realize his troubles came from his abandonment from his own mother. As a result, the boy successfully overcame his troubles.

As mentioned before, after watching the horror film, *Warlock*, the 15 year-old boy killed a seven year-old to make a flying potion. The 15 year-old adolescent had a single mother who was an alcoholic and often left him home alone and had a grandmother who died one year before this incident. Drs. Robin Menzes and Wood Hill assessed that the adolescent was prepsychotic or severely schizotypal with social withdrawal and bizzare thoughts. The boy said that he had the feeling of being in the presence of the Devil since he was three years old. Thus, he later developed psychotic illness with delusions and auditory hallucinations of invisible friends talking to him.

Horror Films Affecting Children and Adults

PTSD after watching a movie can affect more commonly in children. This is because children are still confused by distinguishing what is real and is fantasy. A study at University of Wisconsin, Madison, states that children who were under 14 years old had increased chances of developing anxieties conditions later in adulthood after watching horror film. For adults, PTSD

can occur because we relate with identifying with the characters on film. When the viewers see themselves as the characters that are suffering through horrifying experiences, it triggers the viewers to remember their own traumatic personal experience.

Horowitz (1969) paper gives an experimental study to test Freud (1954) theory of psychic trauma: Horowitz states:

A traumatic experience remains in some special form of memory storage until it is mastered. Before mastery, vivid sensory images of the experience intrude into consciousness and may evoke unpleasant emotions. Through such repetition images, idea and affects may be worked through progressively. Thereafter, the images lose their intensity and the tendency toward repetition of the experience loses its motive force. This tendency to repeat images of trauma activates defensive or controlling aims from the standpoint of the ego, two motives may operate. One opposes repetitions of the imagery because the affect excited may be overwhelmingly unpleasant. The other favors working through by repetition. An ideal compromise is control achieved by regulating the imagery so that the affect elicited with each 'dose' is within tolerable limits (p. 4).

Horowitz's paper explains that some people who experience trauma report memories of traumatic events enter long after the traumatic event took place. Horowitz (1969) study is to extend Freud (1954) theory that the psychic trauma overwhelms the processes that usually maintain homeostasis. These stimuli then return to mind as vivid images, which Freud also calls as "untamed memories."

Turley and Derdeyn (1990) present that the impact on horror films on adolescents are similar to younger children listening to fairy tales. Bettelheim (1975) explains that bedtime stories help children to help manage their fears and anxieties. These stories, like horror films give a cathartic relief where the first villain hurts the protagonist but in the end the protagonist successfully defeats the bad guy. The child can identify himself with the protagonist and the satisfying relief of defeating the villain helps him to fall asleep. Similarly in horror films, the ending in which the protagonist wins over his villain gives the audience a sense of relief by releasing all the tension and anxiety.

Tudor (1989) researched 990 horror films in Britain from years 1981 to 1994, proposing a three part narrative: instability is introduced in a stable condition, threat to instability is resisted, and lastly, threat is diminished and situation becomes stable again. His proposal supports Turley and Derdeyn's idea that horror films are a way to master anxieties. If the viewer is not overwhelmed by the underlying psycho, social, and cultural stress factors in the movie then the viewer can overcome his anxiety. But, if these factors become too stressful then the viewer can experience trauma.

PTSD in Horror Film Actors

During or after filming, many actors experience horrifying events such as television screen flickering on and off, film crews getting into accidents, and having objects misplaced. Sometimes when actors film shower scenes, they would avoid showering because filming can embed the intense and distressing emotions in their minds.

Conclusion

Indeed, PTSD and cinematic neurosis are shown more in individuals who are in a vulnerable emotional and psychotic state. These images might affect those who have troubled

past histories such as childhood abuse, negligence, and domestic violence. These people may have harder time differentiating between reality and films, and therefore developing symptoms of stress, anxiety, and fear. Not to mention, some horror film actors develop PTSD during filming or after shooting the movie. Possibly, because of their strenuous working hours and exhaustion after a long shoot, actors may become vigilant of everything happening around them. Perhaps, this can cause them to be anxious and hypersensitive to trivial matters that are not dangerous.

Conclusion

Horror films visually depict the psychological emotion, mind, and behavior of characters with mental health problems. Although in some films mental illnesses might not be portrayed accurately, they are effectively used as a storytelling method to explain the violence.

Horror films attract audience through different elements such as acting, costumes, sound, camera shots, editing, and setting. These techniques make horror movies compelling by using visual psychological stimuli rather than words to convey the theme.

The visual art and science behind horror films are thoroughly put together to create fear responses as well as satisfaction from the viewers. Science helps us to understand our physical reactions from viewing scary scenes and how it affects us mentally. In the same fashion, filmmaking helps us to understand how our brain works from multiple brain regions that are active while watching horror. Neurocinematics further explains our brain activity that lights up when watching certain motion pictures using fMRI scanners.

Today, more psychologists and brain scientists are interested in the cognitive and biological underpinnings of cinema. Ultimately, cinema is a bridge to connect the audience, filmmakers, and scientists to understand the psychology of the audience and the form of cinema.

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