

LIGHTING IN PANDEMIC FILMS

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ABSTRACT

A genre recognition coincides with what a film is about through an identification of sound, mise-en-scene, dialogue and a cinematography elements. Although films are indistinctly classified of a specific genre, film elements can be a parameter to define the film belongs. A lighting which is one of the elements in mise-en-scene is known as a key to storytelling. A lighting in film unquestionably enhances the film stylistic value. Despite most genre critics argue that films will share consistent narrative patterns, however Rick Altman, Daniel Chandler, Bruce Kawin and Steve Neale have distinguished a cataloguing of similar elements approach that define a genre such as lighting. Therefore, the works of (Bordwell and Thompson, 2013) and (Pramoggiore and Wallis, 2005) are explored to identify which are applicable to genre classification to identify consistency of lighting features. This research introduces a genre for pandemic via lighting categorisation. Our approach is to identify pattern of lighting in pandemic film related by using exploratory data analysis to investigate the lighting pattern of four pandemic related films released between 2002 and 2012. We studied the length of lighting style used in each film with simple calculation to investigate the most lighting style applied and to identify the similar lighting pattern used in the films. This study is particularly investigating pattern of lighting, therefore using Sijll six lighting type, we find the four pandemic related films share a common lighting pattern. The paper begins by discussing the problem arising from definition and categorising a genre for film. Then, follow a discussion of historical evidence of previous lighting method used in exemplarily films and analysed each film lighting style using exploratory data analysis. The method shows promising result which can be applied to study other elements for classifying pandemic film.

Keywords: Genre pandemic, genre theories, mise-en-scene, lighting style.

INTRODUCTION

A film genre usually is defined through its narrative convention in which the films share a certain fundamental characters such as Horror genre is associated with darkness, shadows and mostly the characters' face is only half lit. A genre also is a set of rules that shapes of the patterns, form of styles that supervised the filmmakers work and audience reading of the film Ryall, in Strinati (2000). While Altman (2000) argue that semantic and codes are elements that defined a genre. He explains further that gun, horses, landscapes; characters are the codes for Western. What constitute a genre is still debateable among scholars. Fowler (1989, 216) and Wales (1989, 206) in Chandler (1997) state that due to too many genres, some of the genres are not named such as pandemic film. According to Kim et al (2007), IMDb database has listed twenty three distinct genres and among the list pandemic is absent. Apparently, most of the film with pandemic theme portrayed pandemic comes from foreign land, pollutions or changes in disease pattern or animals which cause sickness to human and yet these films are categorised under genre of drama, horror and science fiction. Although pandemic film is gaining popularity because of the latest issues that surround us such as the changes in global environment that causes pollution as well as the series of outbreak in few countries such as Ebola, MERS, SARS, H1N1 and the latest is Zika, film of this theme is important but under studies. A qualitative usually is premier method used in analysing a film specifically to study film genre. However, there has been a number of researchers' who used quantitative analysis of style to study

films. (Baxter, Khitrova and Tsivian, 2015; Butler, 2014; Redfern, 2012; Redfern, 2014a; Redfern 2014b; Schaefer and Martinez, 2009) on cutting rates and editing patterns (Baxter 2012; Kovacs, 2014; Redfern, 2013; Salt, 2004) framing (shot scale, camera style, etc) and camera movement. The statistical analysis which part of quantitative method offers the way to recognise pattern by measuring and quantifying characteristics in numeral and specific manner. There are several measures to choose from and the results can be various or consistent depending on the subject matter or context. This paper apply Salt's method to illustrate how lightings are put together. The data was collected by hand but it then transferred into Window excel 2013 to gives us a similarity measures among films. This paper aims to introduce a pandemic genre via lighting categorising using statistical analysis. A specific aims is to determine if there is a common lighting style used in four films of pandemic related by identifying similar patterns in lighting classification. This paper firstly, discusses the exploratory data analysis to studying film style. Follow by discussing the method used in this paper and describes the sample of pandemic related films. Finally the results are presented with each of the films discussed individually in order to understand what type of lighting patterns used and to conclude about lighting category that defines pandemic genre.

LITERATURE REVIEW

Off all mise-en-scene elements, a lighting is an essential as dramatic action because it functions for audience to see action, guide attention to key gesture as well as built suspense (Bordwell, 2013). He explains further, that lighting can highlights every single shape and objects to look dramatic. In some cases, a lighting defines a film genre. For example, a dark lighting is associate with film noir (Caldwell, 2008) and the dramatic lighting defines of genre horror. (Pramaggiore and Wallis, 2005). Most scholars agree that a lighting set a mood and create an atmosphere. Similarly, a lighting also can emphasis an object, a character and narratives of films. The used of techniques such as highlights and shadows are intended for an image of the texture to glow in the darkness or to look partly shady (Bordwell and Thompson, 2013). Highlights and shadows are used since The Classical Hollywood filmmaking. The techniques are continuously used in recent filmmaking because it creates powerful image. In *The Sixth Sense*, the boy's face was highlight's from below indicates that fright enveloped him as he feels the present of a ghost. In film, two techniques are integral since the era of the Classical Hollywood Age. The first is a high key lighting which involves bright, clear images of full lighting with little shadows in the scene. While the second techniques is a contrast with large shadows and little light which is knowns as a low key lighting. The low key lighting usually convey intrigue and danger to create feeling of shock and unease in audience (Pramoggiore and Wallis, 2005) such as used in Horror film. In Black and White Hollywood films, this technique is significant because audience will be able to recognise whether the film is bright and shadowless. Hollywood also employed a standard of three point lighting: the back light, the key light and the fill light. Some scholars explain that a fill light balances the amount of light of a scene to eliminate or soften shadows as well as to create mood. Josef von Sternberg in (Bordwell and Thompson, 2013) stated that 'the proper use of light can embellish and dramatize every object'. For example, in Classic films *The Cheat* (1931) where the man's face and body were highlights, it indicates that the man's was guilty of cheating and the shadows suggest he was in the unseen jail cell. While in *Pickpocket* (1959) highlights the edge of the fingers of a man. In film conventions, (Sijll, 2005) states that the lighting style has extended to six categories of cinematic storytelling. She further explains that 'Rembrandt Lighting is to create contrast of light and dark'. The lighting focuses on the action while shadows appear in other areas. This technique of lighting is intended to heightened dramatization in the scenes, to express whether the characters' choose to do good or evil or to face life or death. In *Apocalypse Now* (1979), high contrast lighting was used to dramatize Kurtz madness and in *Godard's Passion* (1982), the moral goodness of the lady was associated with backlighting. A low key lighting in *Casablanca* (1942) was used to good effect to reveal emotional feeling portrayed by the actor. The film noir style was applied to create conflicting mood faced by the actor. The used of Rembrandt lighting that creates contrast of light and dark of the subject. A Key light illuminates the face of Ilsa

while the Back light and Fill light provide a counterbalance during a close up of Ilsa suggests her confusion feeling for Rick and her feeling for her husband, Victor. The last scene shows the choice Ilsa has to made, to follow her husband to leave the war zone or stay with Rick, her lover. According to Smith (2006), a low key lighting was spread throughout the movie 'gives an unrefined edge to her confusion and accentuates the awkwardness of the situation'. TV Lighting style is usually 'bright, flat and shadowless' to give the subject matter unpleasant feeling. In *Natural Born Killers* (1994) the lighting style suggests unpleasant feeling of Mallory when she answered her boyfriend question about her parents. Natural lighting is the light that come from natural sources such as sun, moon, campfire and candle. According to Sijll (2005), candle is used as a technique to suggest 'romance, festive and harmony' and to capture the authentic atmosphere at that time. Films such as *American Beauty* (1999), *The English Patient* (1996) and *Mr. Hulot's Holiday* (1953) used natural light for different purposes. In *Mr. Hulot's Holiday* (1953), a natural lighting was used almost throughout the film because the setting was at the beach in Brittany. The film therefore, use the natural light or motivated lighting such as sun, moon, hotel lights and other ready lights that exists in the frame. According to film critic Roger Ebert (1953) he describes the movie is a comedy with simple story and plot. The film is about a single man Mr Hulot's holidaying alone by the sea town. A week vacation during summer holiday has made the townspeople and guests uncomfortable and annoyance of his clumsiness, such as when his aged and noisy car has a flat tyre car that disturbed a funeral and he blundered into a funeral and was mistaken as a mourner. Although the scene is supposedly display a sad feeling but seeing the bright and natural light, the sun suggest otherwise, comical. The film as Roger Ebert describe 'the simplest of human pleasures: The desire to get away for a few days, to play instead of work, to breathe in the sea air, and maybe meet someone nice. It is about the hope that underlies all vacations and the sadness that end'. Most key lighting are used in comedies and musical, undoubtedly this style creates rejoice, merry and delightful feeling: A dramatic values which is recognised by its simplicity and understandable meaning such as in *Mr. Hulot's Holiday*.

In film *Fatal Attraction* (1987) and most thriller genre, the motivated lighting dominates the lighting style. This style of lighting 'refers to any light that are naturally exist in the world depicted in the frame' (Sijll, 2005) such as a table lamp, or light from a signboard or a lamp post. While, Unmotivated Lighting often associated with presenting a moral goodness of evil and darkness character. The light used cannot be seen or unexplainable suggests a person with good character is only a cover up of his darkness and evil behaviour such as the character of an assassin in *The Professional* (1994). The Motion lighting refers to a moving light of vehicles in *Contagion* (2011), a torch in *The Crazies* (2010) or a swinging bare light bulb in *Psycho* (1998). The style is tended to whether create fear in the audience, or create romantic feeling or raise sympathies for the protagonist (Sijll, 2005). Within the context of this paper, we define what pandemic film is and why it is important to this study. Mostly researches on pandemic films are related to health education. Works of Hashemian and Yach (2007), state that one of the impacts of globalisation is the changes in the pattern of disease which have heightened the interest of study on the disease and public health issues. In addition, Tomes (2012) points out the virus film affects general understanding of disease and how they shape popular illness beliefs. While, Papas et al (2003) only listed *Outbreak* (1995) and Ian Lipkin a Colombia University epidemiologist commented that the *Contagion* (2011) are positively accurate that the portrayals of fictional viruses in both movies were based on real life outbreaks. Little is known about research on pandemic film except research by Anthony Enns on film analysis of *Safe* (1995) which he describes the film highlights the issue of relationship between illness and identity rather than discussing the genre category. Therefore, the absence on this topic could be explained by analysing what pandemic film is, how does it look and does the narrative and form in pandemic established concordance with genre codes and conventions? And to consider the idea of pandemic film or should it categorise as a subgenre? In formulating this genre, this study proposes to draw on the genre theory of Rick Altman, Daniel Chandler, Bruce Kawin and Steve Neale to explore which practice is relevant to classify a genre.

The pandemic in Global and the Islamic World.

The Muslim world has experience the deadly pandemic when the disease was identified in Saudi Arabia in 2012 and has spread globally to 26 countries including Malaysia. According to the world body, they notify 238 cases and 92 deaths related to the virus worldwide (The World Health Organization, 2015). Middle East Respiratory Syndrome Coronavirus known as MERS COV is the latest disease after the world has seen Severe Acute Respiratory Syndrome (SARS), and bird flu or known as H1N1 that killed hundreds people. These deadly virus exhibits similar symptoms' where the victim experience fever, cough, difficulty in breathing to seizure and finally organ failure. Similar to SARS and H1N1, the diseases are all originated from animal. In MERS case according to Centre of Disease Control and Prevention (CDC) the camel is possibly the cause because most of the victims reported infected with MERS have contact with camel. (Leonard, 2015). Therefore, CDC has advice public to avoid drinking raw camel milk or camel urine and to cook the meat before consume. Most victims are those who lived in or travelled to the Middle East. While, in Malaysia only one death reported in 2014 after returning from pilgrimage. Although MERS is not a serious case in Malaysia, it is essential for Malaysian to know about the disease. For example, what are the symptoms and the incubation period that are important to give attention. The highest cases as of July 2015 is Saudi Arabia with 217 cases follow by Korea with 185 cases. In the weight of the outbreak, a Biologist Nathan Wolfe in his book 'The Viral Storm' reveals that the possible risk of pandemic will spread and create havoc due to the mass movement of humans. He also points out it is necessarily that the media, in this case film would be able to convey messages and asses risk when an outbreak occurs. Although film about pandemic exhibits fictional virus, somehow, it relates to the reality diseases such as SARS, H1N1 and recent is MERS that are originated from animal and it becomes contaminated and eventually spread rapidly. Hence, the rational of this study lies in pandemic film that become prevalent in recent decades and importantly its exhibit fictional global outbreak scenario and possibly the globalisation plays the part.

Introducing a Pandemic genre

Most narrative in film of pandemic related exhibit diseases infected host victim and the disease become an outbreak. Once connected to the source of infection, they have become a problem and the protagonist will embark on dangerous journey to find a cure. While a team of doctors and scientist will do some test in a laboratory to identify what the disease is and try to find solution to vanquish them. In terms of the narrative surrounding pandemic films, we are able to see the victim in agony and eventually die. The outbreak causes chaotic situation where society face the dead lock situation which make them fear, panic and anxious to escape from the situation. Although Horror genre share similar emotion of definition, the feeling is more of supernatural implying, while pandemic film indicates the emotion of authenticity. Most importantly, the lighting used in films of pandemic related are combination of the high key lighting and the low key lighting. In addition, the lighting of bright and shadow serves the purpose of representing a tumultuous feeling that affecting the audience. This project introduced what pandemic film is and interpret the aspects of film style via the lighting pattern.

Current study

The significance of this study lies in pandemic film that presents a complex picture of the world during the outbreak because it presents the reality that society cannot ignore whether the representation of virus can shape their belief or not of the virus. Therefore, films with pandemic theme was chosen due to its indistinct status as a mix genre. These films were classified as mix of horror, thriller, disaster, action or drama and science fiction, despite the narrative pandemic was the main feature in the films. In addition, films with this theme possess multiple narratives. Having established as association with science fiction genre for years, it suggest that this theme to have its own category. Moreover, first pandemic film Arrowsmith (1931) has been produced a half century ago and have become prevalent for the past twenty years. Although film with this theme are not

recent, research on this theme is not widely explored specifically surround its genre, narrative and film style. Furthermore, themes in pandemics film are too broad and unsettling to distinct its category. We find this issue must be addressed because film of this kind must have their own identity that contains the look of pandemic genre. In order to introduce pandemic and identify what particular convention of lighting are, four films were chosen featuring pandemic related theme. The films are *The Crazies* (2010), *Contagion* (2011), *The Happening* (2008) and *Cabin Fever* (2002). To identify similar recurrent lighting style, the running time of each films was used to investigate the lighting pattern. All films are analysed scene by scene to explore what are the frequent used of lighting style throughout the whole film.

Exploratory data analysis (EDA) and style.

A genre is often associate with a narrative. However, the techniques used in filmmaking particularly known as film style (mise-en-scene, framing, editing, sound etc) also can constitute a genre. The purposes of classificatory a film genre are to guide producers and writers to make films to cater to audience interest, for promotional and audience expectation (Mc Kee, 1997). Previous genre studies classify a film based on plot-types (Friedman, 1989) text recognition (Corner, 1991, Tudor, 1994) and features: shot length, visual distribution, and colour, audio and lighting key (Sanjay and Jadon, 2006). The previous studies discussed how genre can be recognised by using computational method, visual and thematic analysis of existing genre. This paper used simple statistical analysis to determine elements in film grammar as a guide line to introducing a genre of pandemic, specifically lighting key. In film studies, a confirmatory or exploratory approach are usually employed to analysis a film. A confirmatory approach works from problem that arises, to interpretation of model, to data collection and analysis of data. The system is a top-down schema in which the semantic analysis is adopted. (Bordwell, 1989). An Exploratory approach begins with a problem that need to be discovered, follow by data collection and analyse it, establish a model and ends with conclusion of the findings. See figure 1. The process of studying a film style using EDA approach intends to simplify and amplify the analytical process. Furthermore, (Ellison, 1993) states that ‘a graphic displays play a fundamental role in exploratory data analysis’ which is applicable to identifying a similar patterns used in films that we are studying.

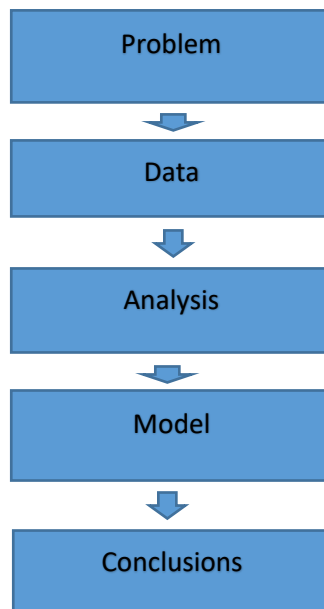


Table 1: Exploratory model of formal analysis in film studies.

The data from statistics will expose the 'underlying structure, extracting features, identifying outliers and anomalies, generating hypotheses and testing underlying statistical assumptions' (Redfern, 2012). In EDA, the data gathered from statistics not only works with numerical and graphical techniques but also can be descriptive to discover what is important to study. Therefore, (Kundzewicz and Robson, 2004) suggest that 'any study that does not include a thorough exploratory data analysis is not complete'. This paper takes approach of Barry Salt (2006) to apply statistical analysis. In his study of an individual directors' style, he studied the normal parameters of films such as average shot length (ASL), shot scale, camera movement and editing pattern. He collected data of four films and analyse shot that appear in the first 30 minutes. The findings display that both shot scale and ASL defines the style of a director. While this paper analysed four films scene by scene and studied the lighting pattern. The collected data on all the scenes in the film running time. Each film analysed type of lighting used to find out the frequent lighting pattern. Analysis was done manually and the later used Excel program to identify the lengthiest lighting type. Figure 2 listed the films subject descriptors.

Title	Year release	Director	Director of Photography	Length(s)	Scenes
Cabin Fever	2002	Eli Roth	Scott Kevan	5534	94
The happening	2008	M. Night Shyamalan	Tak Fujimoto	4036	57
The Crazies	2010	Breck Eisner	Maxime Alexandre	6046	42
Contagion	2011	Steven Soderberg	Peter Andrews	6423	134

Figure 2: Films subjects

All four films have running time between 4000 seconds and 6000seconds. While the scenes of the four films are between 42 and 134. The big gap in the number of scenes indicate that the unit of action that takes place in the location are varies between films. In *Contagion*, the scenes take place in different locations around the globe while in *The Crazies*, the small numbers of scene indicates the location is set in a small town. The lighting pattern was calculated based on the films scenes. Of all, the longest running time is *Contagion* and the shortest is *The happening*. The films have different directors and cinematographers. Therefore, the styles are definitely different. However they do share certain elements such as pattern of lighting to present the film of this category. Lighting has an effect to engulf the whole film as well as to create mood. According to Peterson (2014), *Contagion* used of 'a high key lighting is hopeful and optimistic, low key lighting is sombre, mysterious and moody, dramatic or even ominous depending on the subject'. In the beginning of the film, the high key lighting was on (Beth, the host that spread the virus) with bright lighting in the background, suggesting she is at the airport waiting for her flight home. The lighting changed to low key lighting when a deadly virus becomes contagious and that gives feeling of stirring panicky and feeling of hopelessness. In *The happening*, the lighting was bright in most outdoor scenes especially setting at the field or park. For instance, all the contagious scenes, the used of bright sun as a natural lighting and the long shot of trees suggesting the winds collaborate with plants to spread the killer virus. Similarly, *The Crazies* and *Cabin Fever* used the bright sun as a natural source in the beginning of film to suggest the situation is calm and stress free and changed to motivated light sequence when the situation worsen and the protagonists are trying to escape or to find a cure for pandemic. In context of introducing the pandemic genre, the simple excel program are giving a data of frequent used of lighting techniques in each films. Figure 3 through 6 present the structure of lighting pattern of the four films, along with the tables of the descriptive statistics of each films.

Figure 3: Contagion (2011)

Type Of Light	Length(s)
Natural	2816
Motivated	3530
Motion	26
Unmotivated	1
Rembrandt	50
	6423 Total

Quartile	
Q1	135
Median	500
Q3	3173

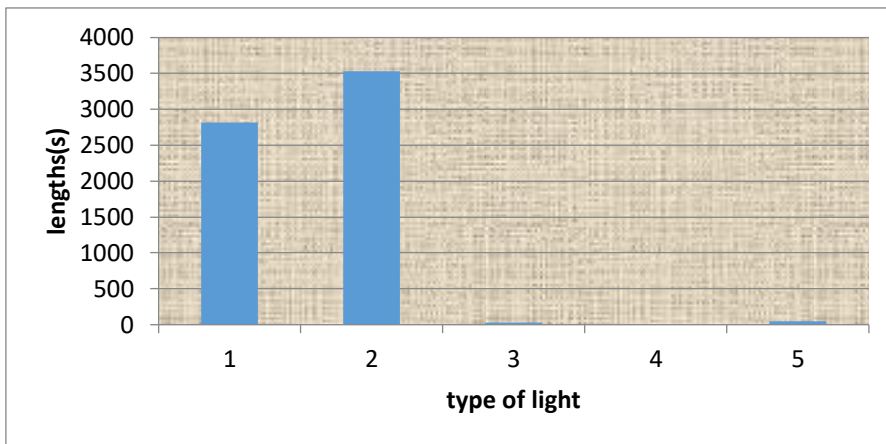


Figure 4: The Crazies (2010)

Type Of Light	Length(s)
Natural	2366
Motivated	2760
Motion	604
Unmotivated	316
	6046 Total

Quartile	
Q1	388
Median	1485
Q3	2661.5

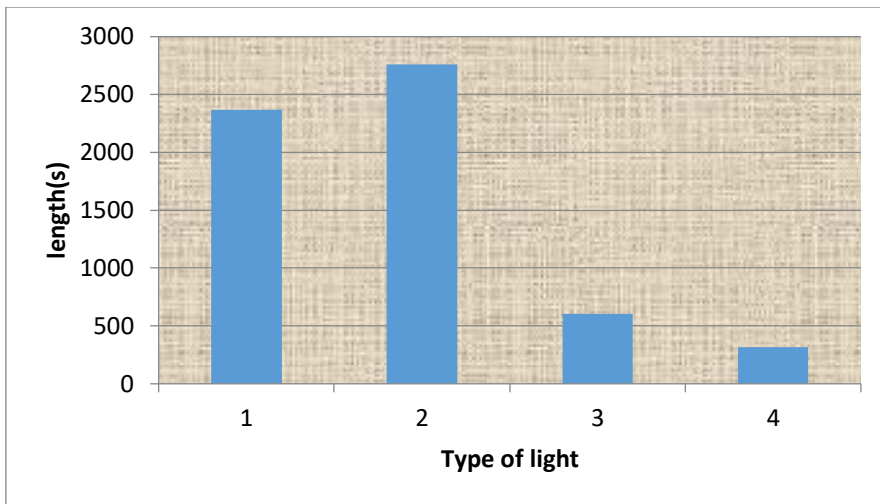


Figure 5: The Happening (2008)

Type Of Light	Length(s)	Quartile	
Natural	2921	Q1	53.5
Motivated	900	Median	108
Motion	0	Q3	1910.5
Unmotivated	108		
Rembrandt	107		
	4036	Total	

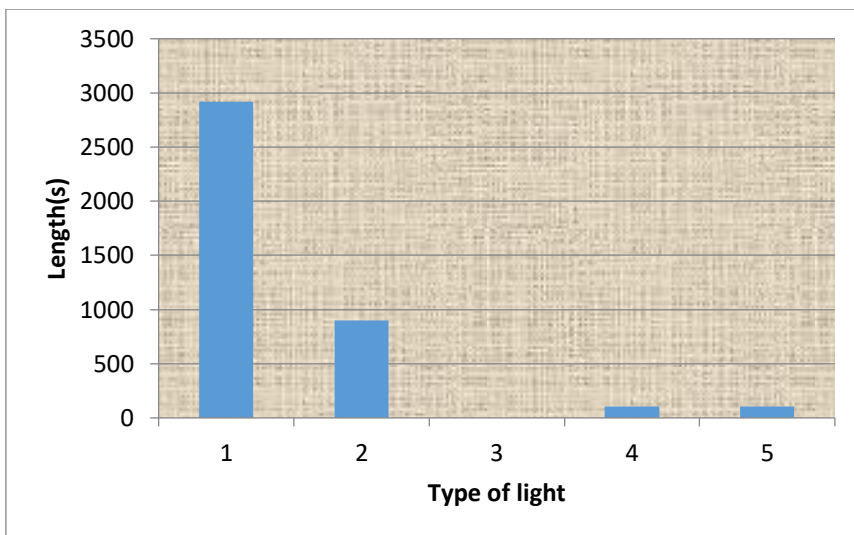


Figure 6: Cabin fever (2002)

Cabin fever

Type Of Light	Length(s)
Natural	3414
Motivated	1494
Motion	156
Unmotivated	454
Rembrandt	16
	5534 Total

Quartile	
Q1	86
Median	454
Q3	2454

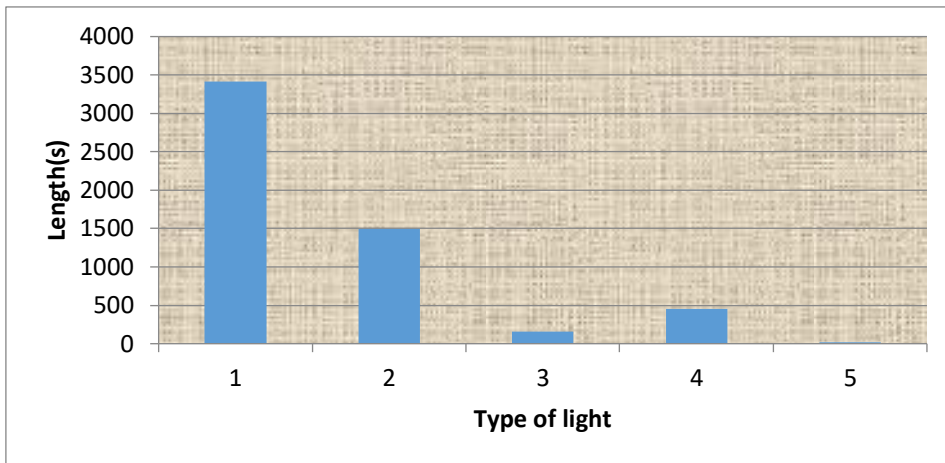
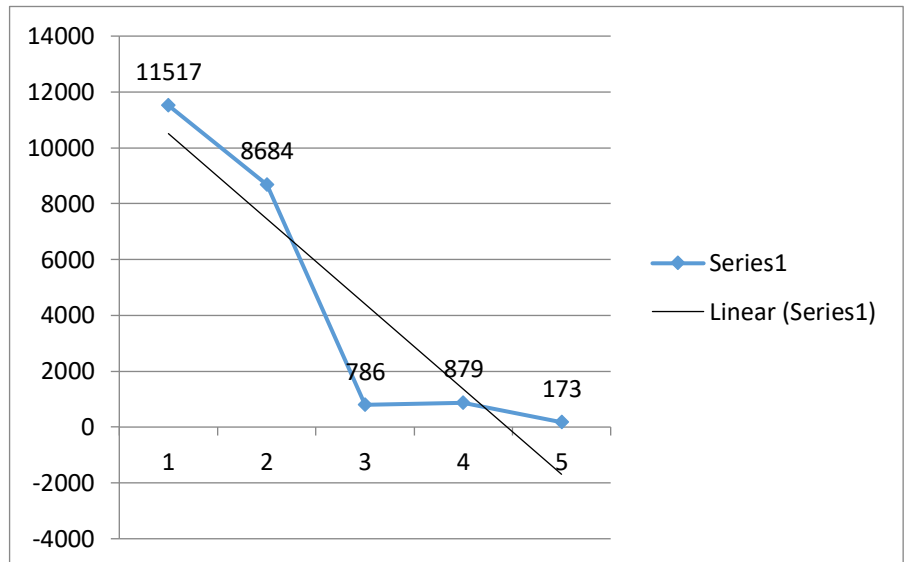


Table 2: Length of Lighting Style of four films.

Type	Total Usage(S)
Natural	11517
Motivated	8684
Motion	786
Unmotivated	879
Rembrandt	173



Contagion (2008)

Contagion was the first film of pandemic related to raise the issue of global pandemic because it shows the locations of pandemic were in different countries. The film setting of winter unlike the other three that of summer suggests that a gloomy weather is where the virus is most active and becomes contagious. The film exhibited the pandemic travelled around the world through the mobility of human and killed millions people less than a month. The scene occurs at 46:58 to 50:11 when Leonara explained to her teammate on how the virus is transmitted through contact because the victims were reported dead less than three days after they reached their home country. All the victims were at the same casino at the same time in Hong Kong and it marks the narrative detail for the genre. Most importantly, the film used motivated lighting (ML) in more than half of total length of the movie and follow by natural lighting (NL) which recorded of 2816 seconds. The most used of ML sequence take place indoor such as at the scene inside the buildings, casino, houses, offices, school and the meeting room between 3:09 and 6:46. Also between 41:27 and 1:34:33 when the virus becomes contagious. The authority, doctors, virologist and scientists are discussing, investigating and working together to combat the virus. For example, at 51:59 to 52:52 was a peak of the movie to show a Long shot of a stadium with full victims that were infected by the virus MEV1 are being treated. A MS of Dr Mears is giving her blanket to the patient beside her with key light on her suggesting that even though at a death door she still sacrifice her needs to help others. Other used of ML sequence were at 33:34 to 36:33 of a scenes in a laboratory and a restaurant. A LS of a scientist working to finding a cure and a LS of another scientist Dr Sherman has observed diners and bartenders coughing and looking sick. This association between the races to find a cure initiates by authority indicates that mass panic and people dying are stressful and the use of motivated lights in indoor scenes marks the edgy feeling. In contrast, the used of Natural Lighting (NL) takes place outside the building with bright sun as a key source of lighting. The public area is where the virus is easily contagious and it linked to the frequent used of natural light are at 2:53 to 3:00 (location is in London where a victim was in a cab travelling to work) and at 3:45 to 3:56 (location is in Tokyo where a man was travelling in a train and suddenly collapse). Similarly, the NL was used at 23:58 to 26:55 when Dr Mears was investigating the Alderson staff who have contact with Beth before she died and then discovered that Bates had and run to rescue Bates that was on the bus to work. Unfortunately, he was already infected and died at the bus stop. The frequent used of natural light especially during day time is to create the situation that pandemic can occurs regardless of time especially in high density area, public places and as well as through people mobility. As noted, the low key motivated lighting is characterised by the existing light in a frame. The sequence of ML can be seen scatter throughout the film as well as NL which is lesser by 12 minutes. NL in Contagion creates feeling of hopeful or despair depending on the situations. For example, a scene where Dr Leonora travels to investigate the infected areas at 11:30 to 12:52 gives hope that the virus has a cure. In addition, at 1:10:20 to 1:11:30 A LS of military troops are giving food supply displays the serious impact of pandemic to the public. Furthermore, NL was also used to emphasise the force of pandemic such at scene 1:09:25 to 1:10:19 presents deserted streets and buildings across the world and mountain of rubbish on the streets. While, ML was structured for scenes to look intense such as making heavy decision, investigating unknown and clueless virus and when a Centre Disease Control (CDC) was under pressure of hiding information. These lighting style was also appear in the other three films. It also marked the element of pandemic film.

The Crazies (2010)

Like Contagion, the dominant lighting in The Crazies was a ML. Similarly, the NL was marginally with 2366 seconds or equivalent to 39:43 minutes which is one third of the film length. Despite of the length, the film has the shortest scenes compares to others. The Crazies was about a small town Ogden Marsh which was infected by a mysterious toxin from a military plane crash. The toxin from the lake has turned the town people into murderous maniacs. The beginning of the film started with NL from the raging fire that burnt the town and as the film progresses it shows the beautiful, serene

and unoccupied town with people enjoying themselves. A LS of a town team played baseball game was disturbed by a man with a shotgun walking to the field with bloody nose raised his gun to shoot at the sheriff who asked him to drop the gun. His strange behaviour has made the sheriff to shoot him as a self-defence. The scene was at day time which used sun as a natural source. The sequence of ML was used in mostly night scenes as well as indoor of a house or a camp or buildings. ML can be seen at 14:00 to 16:02, started at scene of a barn house of William. His wife and son were terrifying of strange thing happened in their barn and the wife investigates and discovered the mower was running and she kills the engine and runs to the house when she heard screaming from her son. The son informed of his father dangerous behaviour and both hide themselves in the closet. A back light was used to display of William when he locked them in a closet. A low key light used in the scene suggests elements of terrify and suspense as well as chill present of death that faced by his family. A MCU of William strikes matches and drop on the trail of fuel indicates his insanity that relates to being infected by the virus. The highest length of ML of 2760s in figure 4 indicates that this lighting style dominates the film. The used of ML in the middle which started at 32:52 to 54:33 of the film was related to the feeling of anxious and uncertainty of who is next to get infected. A LS of the spotlight shines down to the quarantined area creates a panic situation indicates the town people have been infected. In this sequence ML provides a feeling of fearful, distress and edgy of the four protagonists. A sheriff, his assistant, sheriff wife and a medical assistant. All four were struggled to discover the cause of pandemic after saw a series of men became lunatic with their extremely dangerous behaviour. While the used of low key lighting on the town people when the government has ordered the town to be under quarantine and killed anyone who tried to escape suggest that are anxious and fear for their life and family. A Motion lighting from the military trucks and weapon were used minimum with total 316s in length. This lighting technique was used at scene 29:30-29:40 and at 51:52 when the vehicles carried town people to check their temperature and also used to hunt anyone who tries to escape. The film progressively shows of the couple tried to escape the town with lots of ML from scene at 1:16:15 to 1:32:27. At 1:32:28 A low key lighting was used in the last scene to express the impact that pandemic has vanished when the town was totally destroyed by fire and the sheriff and wife were safely escape from the pandemic. The sequence of ML and low key lighting was used from the middle to almost the end of the film to create feeling of fretful, anxious and clueless of the situation that they are into. While NL was use in the beginning and after three quarter of the film length to suggest that the outbreak came from contaminated area. When a person was infected he then passed it on through contact or airborne and became contagious especially in public places such as town and baseball filed. The NL at 59:20 to 1:13:47 shows deserted town and abandon houses. The use of abundant ML and NL signify the pandemic film.

The Happening (2008)

Natural Lighting (NL) was dominant in The Happening with 2921s while ML was only 900s in length. See figure 5. This is contrast to the other two films with ML was mostly applied. The film was about an inexplicable pandemic started in Central Park New York and ends at Arundel County the next day. A short but dangerous pandemic has made a person behave strangely like getting confused, repeating words or worst, killed themselves. Most of the scenes were of LS or MS of outdoor events. Hence, NL was mainly the source of lighting. Furthermore, most of the scene in the film took place in bright sunny day. The film began with pandemic started in a Central Park New York where the virus from trees infected the people at the park when they started to repeat words and killed themselves. The virus from the trees then spread to the whole city carried by the wind. At 5:12 to 6:43 and a camera tilt up to capture an image of construction men jumping off the building willingly. The contagious was getting worst when a camera panning to Philadelphia to show a breezy weather that carried the virus started infected the people. NL was used greatly between 17:46 to 41:56 which shows the protagonists', Elliot, Alma his wife, Jessie their adopted daughter and few strangers were running to a safe County. Unfortunately all the states that they were heading were infected as well. While, three of them managed to escape from the madness of people that were infected, the

aggressive virus is continuing to spread to other county. The ending of the film was a LS of a park in Paris. NL can be recognised by the sunny day. A camera panned to two men who were talking and suddenly one of them started to repeat the sentence and the camera moves to show the people stopped at their trail and the LS of breezy weather suggests that the pandemic has travelled to other continent. Similarly like the other two films, ML was used in door such as scenes in the classroom, inside the house, a train station and at Mrs. Jones's house. Like other films, this lighting style gives idea that the danger is out there, and might attack. The manipulating of the key lights on each actors making the scenes look tense and mysterious. For example, at 9:23 to 9:40, when a principal and Elliot were walking at the school corridor, top lighting on them suggests that something bizarre was happening and the school has to dismiss the students. In the later parts of the film, scenes at Mrs. Jones's house from 1:04:18 to 1:08:37 suggests that ML purpose was to create the feeling of eerie and edgy which can marks the element of pandemic film. The used of low key lighting also emphasises the fear and anxious faced by Elliot and his wife. Although ML was less applied, but it appears to heightened the sense of anxious and uncertainty of the narrative sequences. As noted, NL is associated with the outbreak that spread through airborne and the societal disruption that results. While, ML is related to how society respond to the pandemic and what would they do to control its spread.

Cabin Fever (2002)

Cabin Fever (see figure 6) was relatively different from the other three films, since the film does not display any societal infected by virus except of five friends. The longest running time of 5534s, the narrative was about a group of friends (Jeff, Karen, Paul, Bert and Marcy) were vacationing in the mountains and end with four of them infected by a mysterious virus. Karen, the first victim was sick after drinking the contaminated water from the lake. She then feels ill and later discovered her skin started to bubble and burn. Her friends then lock her in a tool shed to avoid infected. As the film progresses, the other three (Paul, Bert and Marcy) were infected too and then they realised there was no cure for the virus. Jeff, their friend leave the cabin and when he returned he was shot to death and burn by authority that assumed he was infected too. The ending of the film shows two kids collecting water from the stream that was infected by Paul's body. This could be the beginning of a possible pandemic. The first section of the film was very bright light which sees the sun was a natural source of light. The noonday sun creates hard light, while the late day sun when the group arrives at the cabin creates soft light. The NL was dominant in this film with 3414s in length, follows by ML 1494s and motion light 156s. The NL started from the beginning until at 16:00 where the sky was orange indicates it was dusk. Though it was night time, the existing light which was the NL which came from bonfire suggests horror effect when the group shared ghost stories. The sequence of NL emphasises how a pandemic was originated. For example scene at reservoir 1:06:09 the place where Paul discovered the infected man body was floating and concluded the water had been contaminated. Transition to ML typically happens when the scene change from outdoor to indoor. Like the other three films, ML was used mostly inside the cabin especially at night. Light from table lamp and a fireplace gave an intense atmosphere. For example at 48:20-49:43 all except Karen, were panic and checked their bodies if they were infected too. They started to argue about the situation and then decided to quarantine Karen. The dim of ML was associated with the tough decision, worries, and uncertainty as well as fretful that the group faced. The Final section of the film was tricky. The NL usually associated with new hope that pandemic would end. However, Cabin Fever have similarity with The Happening whereby, the ending shows A LS of possible outbreak. A quartile used in this study was to identify the transition between two dominant lightings. Each film change point was of similar pattern of using NL in Q1 which present how the outbreak was started. The image of happy sunny day imply the feeling of normality in audience to what is coming next. All films applied NL except Contagion in Q2. The films as its progress display the feeling of curiosity to what is going on. At this point, the films were in developing the stories where the viruses becoming an outbreak. The director used ML in Contagion to show it happens in Beth kitchen, therefore, a key

lighting was used on her to indicate the symptoms that one might have if infected. While in other three films, NL was used to show the symptoms of the infected victims in open spaces. In Q3, all except *Contagion* used NL. At this transition point, the pandemic has already spread and the situation is becoming uncontrollable. Therefore, the plots were usually in a deciding stage whether involving authority or societal. In *Contagion*, a row of street lights in a frame suggest that the CDC chief and his assistant are having a discussion on how to stop the outbreak. It also indicates that they were working late to solve the problem. NL in other three films indicates whether the casts are to escape or to remain and face the pandemic. For example, in *The Happening*, Elliot and his family as well as other strangers decided to escape the pandemic by travelling to another county. Similarly, in *The Crazies*, the sheriff and his team decided to escape when the military are hunting the town people by temporarily hiding in a barn. While in *Cabin Fever*, Paul has decided not to cooperate when a town sheriff asked about the death of one of the town people who happened to be the host of the virus.

General Discussion

Having analysed these films, some general observations related to lighting style are noted. The lighting according to Fellini in Bordwell (2013) can describe narrative; and it suggests from these results the genre is characterised by a common lighting pattern. Generally, all films displayed two major lighting styles, Natural and Motivated. The pattern of lighting was consistent with the source in the shot. For example, a LS was usually associated with NL. Moreover, crowded places such as a city centre or a park were clearly used NL to emphasise the danger of pandemic usually happens in public places whether through contact or airborne. Although NL seems relatively easy to identify, they are much more difficult to differentiate if the scenes were in a building. While Motivated Light (ML) sources often come from the window and lamp in the frame. For example, in the films, we were able to see bright sun coming through the window but at the same time, the lamp provides hard lighting that gave gentle contrasts between light and shade. The Hard Lighting pattern was used to make the characters look guilty, such as when CU of Sheriff in *The Crazies*, received a report that the man he gunned down earlier was alcohol free: looks forlorn such as MS of Marcy taking a bath when she discovered she was infected by virus (*Cabin Fever*) or look irritating like a MS of a scientist lady, when the chief officer of CDC asked when the vaccine is ready (*Contagion*) or feeling of loneliness when Moore, his wife and Jessy were separated at Mrs Jones house (*The Happening*). While, the Soft Lighting was used to soften contours and textures. For example, the pattern was usually used for a realistic and natural effect (Stinson, 2003) such as at outdoor scenes, which only used available light to create a sense of realism. For example, like in *Contagion*, Dr Mears and her assistant were driving to rescue Bates, or Paul and Karen, were both swimming in a lake in *Cabin Fever*. A series of running scared which sees Elliot and family as well as strangers were running from field to field to escape from pandemic in *The Happening*. Finally a scene at a baseball game in *The Crazies*. This single source which referred to a natural light used in the films often presents realistic events. Every scene is represented by different lighting techniques for different times and settings. Most ML were presented in MS in all four films. The analysis found that the similarity between shot and light style were occurred in two sections. The first section was during making a decision. In *Contagion* MS of CDC people were discussing about whether to make it public or silence until they are confirmed about the virus. Similarly, in *Cabin Fever*, when a group discussed how to isolate Karen and treat her sickness. The happening sees ML was used in the auditorium and school corridor when a school authority emphasised the danger of unknown pandemic and decided to dismiss the students. While, in *The Crazies* the MS of the Sheriff and wife were having a discussion about leaving the town when the military scooped them into a truck heading to quarantine area. Second section sees MS and ML were relatively related to display the victim's agony. In a scene in *Contagion* where Beth collapsed in the kitchen, a camera focused on her face till her abdomen to show the effect of virus that caused her pain and seizure that led to her death. Similarly in *Cabin Fever*, Karen's body pain was focused at MS which supplemented by the dim light from the table lamp to emphasize her suffering. The results were contrast in the usage of ML to display agony. In *The Crazies* and *The Happening*, ML was used to

display victims that suffer from the deadly virus. The ML was placed at the contaminated camp to show the seriousness the pandemic caused. While, NL was used to display infected people in The Happening. In General, Lighting in pandemic related films were used at different settings and times. Although NL and ML were used, other lighting style were also applied minimally. Overall, dramatic lighting style used was to create mood such as agony, fretful, hopelessness and dejected. The result presents similarity pattern in the usage. Furthermore, this lighting style reflects the uncertainty situation for survival and desire to pull through. Contrarily, NL was used not only in calmly situation but also in horrendous situation. The result displays divergent in lighting style. This could coincide with a directors' intention to highlight that viruses can spread regardless of time and situation. However, the lighting commonality structure can be seen at the beginning and ending of the films. This lighting style could possible demonstrates the feigning of outbreak or rekindle into new life.

CONCLUSION

This paper presented an introduction to lighting style used in pandemic related films using exploratory data analysis. EDA provides possible framework to studying film because it gives researcher freedom to explore the elements of film for classifying a film genre. Applying this method, we are able to identify the change point in the lighting pattern as well as frequent used of lighting type. The result has shown that this data can be used to indicate the pattern of lighting for pandemic films which has two types: Natural and Motivated. We identified different lighting used at different settings and times. We also found out that a genre can be characterised by different lighting pattern and noted the importance of lighting in staging mood, characters, body pain and situation. Although our approach is simply and easily understood, however, the method would be best to apply to other subjects of mise-en-scene and narrative to categorising the pandemic related film.

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