

# Cinematic Devices of the Filmmaker

## Preliminary Notes by the Instructor

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### SECTION ONE

#### Introduction

Every year, the more than 23 thousand film screening galleries in cinema theaters across the U.S. sell over a billion tickets to shows of hundreds of new films (local and foreign) released annually in the U.S. Additionally, there are the streaming services of the likes of Netflix, Amazon, YouTube, etc. that also deliver hundreds of films to millions.<sup>1</sup> Clearly, films are among the most popular of art forms in the U.S.

Yet, ironically, the film is also the most complex of all art forms ever invented by human beings that draws upon a number of other different art forms for its creation, including: theatre, literature, photography and music. To suggest that films are a complex art form (therefore by implication accessible--in terms of appreciation--only to the educated and/or the intelligent) in the face of their overwhelming popularity with the general public, on the surface, does not make sense. How does one account for this apparent contradiction?

The truth in reality is that the vast majority of the film-viewing public constitute a gallery; that is, they do not fully comprehend this art form. The problem is not so much the basic story line in a film (for most that is not difficult to comprehend), but rather the method and technique that the film-maker employs to communicate to his/her audience the story in a manner that (a) successfully forces the audience to suspend reality and resign itself (visually and emotionally) to the imaginary world that the film-maker creates on the screen; and (b) in the case of a good film, force the audience to think about what they have seen in the film even long after they have viewed it. It is the purpose of these notes to look at this important dimension of films so as to, first, encourage a fuller appreciation of this marvelous invention and thereby, hopefully, enhance the enjoyment of the film-viewing experience, and second, to encourage respect for film-makers as artists. Films are not just a form of entertainment, they are also a means of communication by which the artist communicates his/her art.

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<sup>1</sup> (a) Throughout these notes, unless indicated otherwise, all reference is to feature films (popular narrative films) released in commercial film theatres for mass audience viewing. (b) Although distinctions can be made between the terms films (the process of filming), cinema (the internal aesthetics of films) and movies (commercial screening of films) these terms are used interchangeably throughout these notes.

## The Illusion of Movement

Unlike in the case of video, the illusion of movement in film is dependent upon a rapid projection of a series of still photographic frames that are, both, during exposure (when the film is being shot) and during projection (when the film is being viewed) kept motionless for a fraction of a second. The question that arises is how does the illusion of movement emerge in the first place?

It used to be thought that were it not for the phenomenon of 'vision persistence' first examined in the 10th century by the Arab scholar Al Hazan, films would not exist. Vision persistence, it was said, was the human brain's inability to wipe out an image immediately upon its disappearance from view. The theory was that the brain retained the image for a short time even after it had gone from sight. For films to come into being, therefore, what was required was an invention of a mechanism that could project still images on a screen in succession at a speed sufficient to fool the brain into thinking that it was viewing images in motion. This mechanism, sometimes referred to as the pull-down mechanism (PDM) or the intermittent motion mechanism was invented independently roughly around the mid-1890s, by Thomas Armat in the U.S. and the Lumiere brothers--Auguste and Louis--in France. The invention of this mechanism (which during photography permits the filmstock to be moved through the camera a frame at a time, to permit exposure of each frame, at a given constant speed) made possible the photography and projection of still images at the optimum speed of about 40-48 frames per second.

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FOOTNOTE: In practice films are shot at the speed of twenty four frames per second; that is, the film is held still in the camera for one twenty-fourth of a second to permit exposure of a negative frame, before the shutter closes to allow the exposed frame to be pulled down so that the unexposed frame above it can be placed in position for the next exposure. However, by means of a variable, twin-bladed projection shutter mechanism, the film is shown at the illusory rate of 48 frames per second by starting and stopping the projection of each frame as it goes through the projector (in other words, each frame is projected twice).

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However, while it is true that without the invention of the PDM films would not be possible, the theory behind its relationship to human vision (embodied in the theory of 'vision persistence') has been shown to be false. (See Anderson and Fisher, 1978; and Anderson and Anderson, 1993.) The truth is that science has not yet definitively proven exactly how the human eye creates the illusion of motion out of the projection of a succession of still images. However, going by Anderson and Anderson (1993), one can say this much: that there is some evidence that suggests that the human brain processes visual information of motion gathered by the eye differently from non-motion (still) visual information, and it is in this difference that the explanation for the cinematic illusion of motion is most likely to be found.

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FOOTNOTE: One such evidence, they observe, is clinical evidence; specifically: the existence of two relevant, but diametrically divergent, peculiar neurological disorders of vision: one called \qf

akinetopsia and the other is a type of 'form imperception.' A person suffering from the former is unable to see objects when they are in motion, whereas a person suffering from the latter disorder can see objects only when they are in motion--immaterial of whether the motion is real or apparent (as in the case of films). To elaborate: they suggest that research indicates the existence of, first, what may be called short-range and long-range apparent motion perception and, second, the inability of the human brain to distinguish short-range apparent motion perception from real motion perception. The perception of apparent motion termed 'short-range' is one induced by closely spaced flashes of images on a screen, while the reverse is true for apparent motion labelled 'long-range.'<sup>2</sup>

## **Verisimilitude**

Films by their very nature are an exercise in deception. It is through the element of reality-illusion at all the three levels of form, context and content that the film-maker entertains and communicates. At the level of form, the illusion of reality is generated by a finely balanced projection of a series of photographic images coordinated with sound (and today, color) that give the illusion of movement and 'real world' feeling to the viewer. The degree to which the viewer is unaware of this illusion in his/her engrossment with the film story-line constitutes the measure of the success of this form level reality-illusion. At the level of context, the reality-illusion is achieved by construction of appropriate props and sets and/or shooting at appropriate locations with appropriate casts, stunt people, etc. Here again the degree to which the film viewer is unaware of the mechanisms used to create the reality constitutes the measure of success of this context level reality-illusion. At the level of content (comprising the actual story-line of the film) the reality-illusion is, of course, dependent upon how well the actors perform in the process of executing the story-line.

Now in all three cases (form, context and content) the reality-illusion is highly dependent on two factors for its success: technology and technique (both of which, incidentally, cost considerable money). In other words, the reality-illusion quality of the film is dependent upon the presence of skilled and experienced actors, cinematographers, lighting experts, film editors, and other film technicians and on the quality of the camera equipment, film stock and film processing laboratories. However, this is not all: there is a third very important dimension; specifically the creativity of the film-maker. This creativity manifests itself at various levels in correspondence with the various facets of the film technology and film narrative, especially: screen size, film

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<sup>2</sup> The perception of apparent motion resulting from closely spaced flashes of images is sometimes referred to as the 'fine-grain illusion.' This is because the effect is analogous to the perception by the human eye of the illusion of a continuous tone in photographic images (half-tones) found in the world of printed matter--books, magazines, newspapers, etc.--that the printer produces by means of tiny, closely-spaced dots. (Photographs produced by cameras are themselves made up of microscopic, but separate, chemical 'grains.')

This close spacing of image displays (as in the case of the projection of film in a movie theater) is critical for the generation of the illusion of motion that is at once smooth and continuous. Therefore, it is not the theory of 'vision-persistence' that explains how we are able to see motion in films, but rather it is the theory of 'short-range apparent motion.' Between roughly 1896 and 1912, film evolved from a technological curiosity (fit only for expositions and fairs) to a proper, economically viable, communication/entertainment medium. It was not until around 1927, however, that the technology of adding sound to film was perfected. Therefore the period prior to 1927 is usually referred to as the silent period. These then are the basic markers in the periodization of film history. Any others, such as the following, are simply arbitrary: up to around 1950 films hold their own as the only form of 'screen' entertainment, thereafter television comes on to the scene. From 1980 onwards screen entertainment is no longer restricted to television and films; the video revolution during the 1980s creates another avenue of competition.

frame, filmstock, lighting, camera, lenses, sound, editing, cinematic time, and special effects.

## Screen size

When U.S. viewers go to see film today in commercial theatres they will usually encounter one of two basic projected image sizes on the screen: one with an aspect ratio (the ratio between the width and height of the image) of 1.85 or one with the ratio of 2.35. (These ratios are referred to as widescreen ratios--compare them to the 1.33 aspect ratio (arrived at arbitrarily) of television screens.) The first ratio is achieved by masking the top and bottom of the negative film frame, which invariably leads to a loss of 36% of the film frame area from vision. The second ratio is achieved by the use of a special type of lens called an anamorphic lens (first perfected in the 1920s by Henri Chretien of the Paris Optical Institute) which squeezes together the horizontal image during photography and during film projection unsqueezes it. This process, which was first used in 1953 with the release of the film *The Robe* by 20th Century-Fox, used to be called CinemaScope, but today is referred to as Panavision, permits the use of the entire negative frame.

For the film-maker, the aesthetic significance of Panavision (which permits a projected image size of every two units of length for every .35 unit of width) is that it permits making films in which a panoramic view of film scenes is essential--as in films with frequent scenes of extensive landscapes (e.g. *Dances with Wolves* [1991]). The 1.85 ratio on the other hand is useful when much of the action in the film takes place inside buildings involving a lot of dialogue between characters (e.g. many of the films made by Woody Allen) because, unlike Panavision, it creates less space between and around the characters--thereby permitting greater viewer focus on the characters themselves.

One legitimate question that may be asked here is why are panoramic views essential in films? it helps to satisfy the basic desire in film-viewers to simply see things that they haven't seen before, or simply love watching. For example the wedding scenes in Francis Ford Coppola's *The Godfather* (1972) and Michael Cimino's *The Deer Hunter* (1978); or the trooping of the colors in David Lean's *A Passage to India* (1984), or the buffalo hunting scene in Kevin Costner's *Dances with Wolves* (1990), or the funeral march in Richard Attenborough's *Gandhi*, or the palace scenes in Bernardo Bertolucci's *The Last Emperor* (1987) are all scenes that evoke in the viewer the desire to be present at these events as a spectator--either out of sheer curiosity or simple fascination (most everybody loves weddings). The ability of the filmmaker to evoke such a feeling rests on producing scenes that are really spectacularly grand that usually involves casts of hundreds and sometimes even thousands. These scenes, which often are not crucial to the story line, and cost thousands of dollars per minute of screen time, lend credibility and authenticity to the story in the film. From the filmmaker's point of view these scenes are box-office hooks which will draw in the audience into the film theatres. Consequently, only a widescreen can do justice to such grand

film scenes where often, says Boorstin (1990:15), the scenes capture the entire emotional experience of the film.<sup>3</sup>

CinemaScope, however, also attempts to fulfill another desire in audiences: physical realism. While the stories in films may or may not reproduce reality, the scenes in them are expected to reproduce the physical reality of the natural world. Audiences would like to feel that they are actually physically present within the scenes they are watching on the screen. And one way of doing this is to give the image on the screen, via optical illusion, the third missing dimension that can really help in recreating this physical reality: depth. And CinemaScope in its full implementation in a properly equipped movie theater achieves this by means of stereophonic sound. The function of this sound system is to assist with the creation of an illusion of depth. Today, modern theaters that can afford it have gone a step further than stereophonic sound: they use surround sound systems. In the natural world sounds of different things in their totality do not come from a single direction, but depending upon their location, they come from multiple directions. From one direction there may be voices, from another the chirping of birds, from another the rustle of leaves, from another the sound of traffic, and so on. Surround sound attempts to recreate this envelope of multidirectional sound.

## **Film Frame**

Leaving aside the matter of the projected image size, the image frame itself is also an important vehicle for the film-maker's aesthetics. For example the film-maker can choose between an 'open' frame and a 'closed' frame depending upon his/her intentions. A closed frame would be one where the subject is constantly visible in the frame, even as he/she moves around. (This would be achieved by photographically 'locking' the camera on to the subject--that is the camera would follow all the movements of the subject.) If, however, the subject is permitted to leave and re-enter the frame by not constantly following him/her with the camera, then the frame is an open one. In this latter case the film-maker subliminally suggests to the viewer the continuation of space outside the film frame.

The frame is also, of course, the plane on which the film-maker composes his/her image. Composition (the aesthetic patterning of shapes and space) in cinematography follows principles similar to those that apply to still photography, such as the rule of thirds, perspective and texture and framing to name only four. The rule of thirds (an ancient rule of composition) suggests that it is not spatial symmetry (e.g. placing the subject at the center of the image frame), but asymmetry that creates an appealing image. That is the central point of interest (CPI) can be best emphasized by means of spatial contrast in which there is tension and 'movement.' To apply this

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<sup>3</sup> Mention ought to be made of a new type of film that is shown in specially constructed film theatres called the 'Imax' film. The Imax uses screen sizes that are ten times larger than those commonly used for 35mm films. Consequently, the panorama becomes almost an end in itself in Imax films where the immensity of the image is such as to exceed that which even peripheral vision can capture. Combined with a sophisticated sound system the Imax film takes normal film verisimilitude to the ultimate: the viewer is almost enveloped by the image creating a sensation of being actually present within the 'action' on the screen. Unfortunately, the sheer size of the screen carries with it its own liability: the film frame is optically absent (technically, of course, it is still there) given the inability of the viewer to take in the screen at a single view. The problems that ensue for the filmmaker from this absence of the film frame become clear when considering the issues covered in the section on the film frame.

rule the cinematographer divides the image frame with imaginary lines into vertical and horizontal thirds and places the CPI near one of the four intersections. Even in a close up image of a face, the CPI (in this case the eyes) is best placed near one of the intersections.

Of course, it goes without saying that the 'rule of thirds' is not so much a rule but a guideline. Consequently, it is quite possible that drama may be created in an image by going against the rule. Creative cinematographers are not always bound by conventional rules or standards of composition.

Perspective is the convergence of lines toward the central vanishing point in a scene. The use of perspective permits the cinematographer to convey a sense of depth and volume. For example a viewpoint (position of the camera as it 'views' a scene) that permits strongly diverging lines that produce diagonals and angled lines will create a dynamic image (e.g. when a building is photographed from a low-angle and obliquely). In cases where the scene has minimal lines as in a landscape without human-made objects (e.g. roads, fences, powerlines, etc.) that can provide linear perspective, aerial perspective can be achieved by the use of a telephoto lens which will seemingly squeeze together the middle ground by bringing the foreground and background closer together. This effect helps to create a greater tonal range in the scene and thereby suggest depth because objects in the distance are always lighter in tone than those close by-- this results from the fact that light from the furthest points in the landscape have to travel through larger volumes of haze than does light from closer objects.

While on the subject of perspective: it should be noted that it is an important tool that film-makers often use to convey very specific concepts to the viewer. For example when a subject is consistently photographed from a low-angle (making him/her appear to loom much larger than really are) then the film-maker is suggesting to the viewer that the subject is important and powerful. Conversely high-angle shots will suggest the opposite. In other words: manipulation of perspective by using either low-angle or high-angle shots is in itself a powerful vehicle for communicating to the viewer issues of magnitude (be they in terms of power, importance, etc.).

Texture is the photographic conveyance of the tactile feel of a surface (smooth, shiny, rough, sandy, etc.) if one was able to actually touch it. Texture, therefore, is a very significant element in providing a sense of three-dimensionality in an image because it shows the depth and form of a subject. The principle means by which texture is conveyed is via directional lighting where light is placed obliquely to the surface being photographed.

Framing in composition, which must be distinguished from the film frame, refers to the placement of a 'frame' around the subject in the foreground. An obvious framing device is the window or the door frame. The subject placed in the center of the door frame will be 'framed' by it. Framing not only helps to focus the viewer's eye on the subject, but it can also help to create a sense of depth when the frame is dominant in the image.

## **Film stock**

The most obvious difference in film stocks visible to the film viewer is of course the presence or absence of color. A color film is not only visually different (of course) from a black and white film, but it evokes a different emotional response in terms of aesthetic appeal. Prior to the 1940s almost all films were shot in black and white, for an obvious reason (see above). Today the filmmaker has a choice. So, leaving aside economics (for example, color is more expensive than black and white), what determines the choice between black and white and color filmstock? From an esthetic point of view, it will most clearly be the subject matter of the film.<sup>4</sup>

Subjectivity also works at another level when comparing color and black and white images. The black and white image is inherently 'objective' in the sense that there is very little to distract the viewer from the subject within the image. In color images, however, color can be a distraction by virtue of the fact that color also influences moods. For example, (in Western cultures): reds have a tendency to create a mood of danger and excitement; Oranges and yellow induce brightness, warmth and happiness; Greens and blues generate moods of relaxation, peace and quietude; and pastels (colors with low saturation or intensity) are associated with romance and mystery; and bold colors produce moods of liveliness and vitality. Another liability presented by color to the artistically inclined photographer is of course the fact that the world is captured in a more literal way than that permitted by black and white (the world is seen in color not black and white by the human eye); consequently, color photographs leave less for the viewer's imagination than do black and white images. It is for these reasons that, in general (but not always), good black and white photographs compared to good color photographs of the same subjects tend to be superior in that they appear to be visually more dramatic. (It should also be noted that from an archival point of view black and white photographs last longer than color photographs.)

Incidentally, although black and white photography is much cheaper than color photography cost-wise, it is more difficult to execute than color photography. The reason is that color makes it much easier to create a sense of depth on a flat plane than does black and white because depth is dependent in part on separation of individual elements in an image from each other along the axis of perspective (called 'layering') and obviously color, compared to shades of gray, are more easily amenable to this separation or layering. For example: visually, red and orange are easily separable, yet these same colors in black and white would be almost indistinguishable shades of gray.

Subject matters that evoke unpleasant moods (such as melancholy or horror) are most amenable to black and white cinematography. For example, a film like Alfred Hitchcock's *Psycho* (1960) works best in black and white, rather than color. On the other hand, for a film such as *Walkabout* (1971 [an Australian film]), color is essential, given the beautifully wondrous scenes of the Australian landscape. Black and white filmstock may also be chosen when the film-maker wishes

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<sup>4</sup> Notice that in still photography, however, it is not so much subject matter as the kind of photography desired that determines choice. That is if the photography is for commercial purposes (e.g. editorial photography) it will most likely be in color, but if it is for fine art purposes then it will, most likely, be in black and white. The reason why fine art photography tends not to be in color has to do partly with tradition (black and white photography has been around for a much longer period than color), and partly to do with how we view color. Color is perceived subjectively by people (for example the amount of red in the flesh tone of a photo portrait considered pleasingly acceptable will depend upon who is viewing the image), whereas black and white is perceived objectively (black and white is just black and white).

to impart a documentary-type feel to his/her film because of the traditional association of black and white images with news gathering. (For example even today newspapers usually print black and white photographs rather than color--albeit for economic reasons.)

Color is only one of several elements concerning filmstock choice. Another important element is film speed which is the degree of sensitivity to light of a given filmstock (usually indicated by a number rating--e.g. 1600, 800, 400, 200, etc.). A fast film will need much less light than a slow film. For many years film speed remained far behind the human eye in terms of sensitivity to light requiring expensive lighting equipment on film sets. Today revolutionary changes in film technology has made filmstock so fast that they can record images with almost the same amount of light needed by the human eye. What this has meant is that film-makers now have a much wider choice in terms of the kind of lighting they want for a given scene in their films.

The trend, increasingly, has been toward the use of natural or available light rather than artificial light to provide a greater degree of verisimilitude. In the past the necessary use of artificial lighting led to the development of a special Hollywood lighting style in which the lighting in a given scene was finely balanced by means of 'key' (main) and 'fill' (subsidiary) lights. While such a style was generally pleasing it was highly unnatural because we rarely see the world in such balanced lighting.

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## SECTION TWO

### Lighting

Good cinematography does not rest merely on proper exposures and satisfying composition, it also depends on proper lighting. By proper lighting here, one means lighting that works to create a sense of depth on a two-dimensional plane. That is the feeling of three-dimensional space in a film is also dependent on the illusion of depth and volume, and one of the most important tools in creating this illusion used by the cinematographer is lighting. Through different lighting techniques the cinematographer 'layers' (see note above) and 'sculpts' elements in an image to produce a sense of three-dimensionality.

There are, of course, many different ways in which a scene may be lighted (regardless of whether the light source is natural or artificial or a combination of both). Take the following examples: Backlighting: The principle light source comes from behind the subject, but the correct exposure is read off only the subject (and not averaged for the entire scene). Among the uses of this technique includes isolating the subject from the background by creating a wider tonal contrast; highlighting details of the subject (such as hair and the eyes); and when using a low-angle light source (e.g. the setting sun) impart a warm but soft feel to the (now low contrast)



image by making partial use of lens-flare (ambient light being permitted to flare inside the lens). A variation on backlighting is silhouette lighting where the exposure is read off the background rather than the subject. The purpose, as the term suggests, is to throw the subject into silhouette in order to emphasize shape rather than detail. This technique permits the simplification of a detailed scene into one of two-dimensional outlines in which spatial relationships become the dominant motif. Diffused lighting: The light source is diffused either artificially with filters/reflectors or in the case of natural light as a result of clouds or fog or mist. Among the uses of this technique includes producing soft, shadowless, monochromatic images that help to create moods best described by adjectives such as gentle, delicate, romantic, calm, peaceful and so on. Sidelighting: Here the principal light source is directional, but from the side and can be either strong or diffused. The main use of this technique is 'modeling,' that is imparting a three dimensional feel (depth and volume) to the subject by creating distinct tonal gradations (chiaroscuro) in the image. Where the light source is very strong, modeling will be achieved with the use of strong highlights and shadows; a technique much suited for bringing out angles of geometric shapes (e.g. buildings). Balanced lighting: Here the principle light source comes from behind the camera as it faces the subject, accompanied usually (but not always) by fill lighting provided by reflectors and/or ancillary light sources. The purpose is to provide almost even illumination generating mid-level tonal contrast. Images shot in this way appear flawlessly lighted but unnatural. Where the light source is unaccompanied by fill-lighting then it becomes front lighting. Here the light source is used almost like a spotlight to 'pick out' the subject from his/her (or its) surroundings. (Incidentally, fill lighting may also be used in situations where a natural light source (e.g. a window) is deemed to provide inadequate illumination for the scene.) Background lighting: This is lighting that is added to the scene to create highlights and shadows in the background in order to create a sense of time and place. For example: to give added meaning to a scene of a prisoner in a cell, a pattern of bars may be created on one of the walls by placing a cut-out with such a pattern in front of a spotlight. (The cut-out is called a cookie.)

## **The Camera**

An important difference concerning the camera between still photography and cinematography is that in cinematography the camera can also move. There are five basic camera movements that film-makers work with: three of the five movements can only be executed with the camera on a moving platform (such as a boom), while the remaining two can be executed from either a moving mount or a firmly anchored static mount (tripod). The first three movements are called dollying (forward and retreat movements of the camera), trucking (horizontal movement) and craning (vertical movement). The second two are called the pan (horizontal pivotal movement), and the tilt (vertical pivotal movement). The basic purpose behind these movements is to dramatically enlarge the space in the film frame. For example: a panning camera permits the linkage of subjects separated by a wide space in a continuous, and more importantly, dramatic way. The drama is derived from the fact that until the pan is completed and its objective unveiled, the attention of the viewer does not abate. Note, however, that in situations where the subject itself is also in movement the moving camera will seek to link the subject to the changing space

around it. This effect is most obvious, for example, in a pan involving a speeding car in a closed frame where the camera visually 'locks' on to the car.

Incidentally, the moving camera (and this also applies to the 'zooming' lens [see below]) does pose one ethical problem for the film-maker as an artist: should he/she accept the fact that almost always the moving camera draws attention away from the subject to the cinematographer. This is because the moving camera creates a continually changing perspective (an unnatural phenomenon), it forces the viewer to be conscious of its use. Generally, the film-maker prefers that the viewer not be thrown out of the picture by his/her distraction from the storyline to the fancy movements of the camera (or zoom lens) because at the psychological level verisimilitude is dependent upon the degree of viewer 'participation' (or identification) with the action on the screen. The moving camera, in other words, calls into question the nature of the relationships between and among the artist (film-maker), subject (actor) and viewer.

The moving camera is also frequently used for the purposes of indicating the point of view of the subject in the film frame; that is, the camera becomes the subjective camera depicting the subjective view. (The objective view in the film frame is the view of the outsider [the viewer].) A common example of such use of the camera in motion is when, for example, the subject enters an unfamiliar room and begins to look around in the room. Another common example concerns an inebriated subject. When the film-maker wishes the viewer to see the world in the same way that the film-maker's inebriated subject is viewing the world, the subjective camera will be used. That is, the viewer is to assume in such a context that the camera, as it weaves about, is acting as the eyes of the inebriated subject.

## **Lenses**

The movement of the camera can also be simulated by the use of a type of lens known as the zoom lens which has the ability to enlarge or reduce objects in size and thereby simulate movement in the process of doing it. For example: with a zoom lens a film-maker can begin by showing the viewer a subject clinging to the balcony of a 10 story apartment where the frame is filled with almost the entire building and the subject appears the size of a fly; and then, without moving the camera, 'bring the subject closer' by enlarging the image until the frame is filled with a close-up view of the subject's terrified face.

This characteristic of the zoom lens, needless to say, makes a very powerful addition to the film-maker's repertoire of visual tools: the ability to accomplish with speed, but more importantly within a single film frame, such different types of shots as the long shot, the medium shot and the close-up shot. With a single movement it is possible for the film-maker to add a dimension of realism to an unfolding drama that would be difficult to achieve with any other type of lens. For instance: take the example just given; by being able to move through the three different shots in one continuous movement, the film-maker leaves no chance for the viewer to resort to disbelief regarding the drama at hand. This is because all the crucial elements are made visible within the single film frame: the height of the balcony relative to the ground, the clinging subject and the

terror on his/her face. In other words: in a scene like that it is the single frame that works best because if more frames are used than there is the danger that the viewer may be inclined to think that some trickery is at work (e.g. that the subject is not really clinging to the tenth-floor balcony when the close-up shot of his/her face is taken).

How can the zoom lens do what it does? It has a variable focal length which permits it to continuously move through different focal lengths. In other words it can behave like a number of different lenses. A zoom lens, for example, can act as any one of these fixed-focal length interchangeable lenses: a normal lens, a wide-angle lens and a telephoto lens. For cameras that use 35mm film (instead of 75mm or 16mm or 8mm) a normal lens has the focal length (which, for practical purposes, is the distance between the surface of the lens and the surface of the film [film plane]) that falls anywhere within the 35mm to 50mm range. This lens is said to mimic the human eye in that it allows minimal distortion of the image, compared to the other lenses. The focal length of the lens determines how much of a view can be seen through it; that is, it determines the angle of view of the lens. The angle of view of a normal 50mm lens is 46 degrees. Most people are familiar with the 'normal' lens because that is the standard lens that comes with most still cameras.

The wide-angle lens has a focal length that usually falls anywhere between 18mm to 35mm. The angle of view of a 28mm wide-angle lens is 74 degrees. A special type of wide-angle lens with an extremely short focal length (7.5mm) called the fish-eye lens has an angle of view of 180 degrees! Needless to say, such lenses tend to distort the image considerably --especially in linear terms. A common example of a fish-eye lens is the lens used for security peep holes in doors of residential housing. Besides the fact that far more of a view can be seen by a wide-angle lens than by any of the other lenses, it also possesses one other important quality: it has a much larger depth of field. Depth of field is the closest and furthest parts of a subject, say a landscape, that are acceptably sharp (i.e. appear to be in focus) at a given distance of focus. For example if one focuses on a tree, then the zone covered by the parts of the landscape that form the foreground and background of the tree that also appear to be in focus is called the depth of field. A wide-angle lens, in addition, distorts perspective by making objects appear further away from each other than they really are. Note: to some degree depth of field is also affected by the amount of light that is allowed to enter the lens via the variable lens opening called the aperture (the actual mechanism that controls the aperture is called the iris diaphragm). The smaller the aperture the greater the depth of field.

A telephoto lens works in the same way as a telescope; that is it appears to bring objects closer by enlarging them. Any lens above 70mm focal length may be considered a telephoto lens. Unlike a wide-angle lens, a telephoto lens has a narrow angle of view (for example a 135mm telephoto lens will have an 18 degrees angle of view). At the same time it has a very shallow depth of field. This lens also has the effect of making objects appear closer together than they really are by squeezing the middle-ground together. A good example of this effect can be seen when a longitudinal shot of a street full of cars appears to show the cars all squeezed together, bumper to bumper. By using a small aperture (to increase the depth of field) a cinematographer

with a telephoto lens can achieve dramatic visual effects that are not possible to see naturally with the human eye involving the inversion of normal perspective (In normal perspective objects in the distance appear smaller than those that are closer.)

It is clear, then, that because of these different types of lenses, a film-maker can achieve many different photographic effects by either using a zoom lens or some other lens. When the film-maker makes an effort to keep everything in a scene in sharp focus the term used to describe this realist style is deep focus cinematography. Those film-makers who prefer a style of photography that welcomes the narrow depth of field (where, except for the subject, almost everything else is out of focus--an unnatural phenomenon because the human eye does not see the world that way) may be called expressionist film-makers, and their style can be termed shallow focus cinematography. Many film-makers tend to use both styles, depending upon what they are trying to communicate. For example: deep focus (involving either a normal lens set at a narrow aperture or a wide-angle lens) would be the appropriate approach to take in a scene, say a room full of guests, in which the film-maker does not wish the viewer to concentrate on any particular guest \v\ all being considered, in narrative terms, of equal importance. However, shallow focus would be appropriate when the film-maker would like to draw the attention of the viewer to a private conversation between two or more individuals in the room.

## Sound

Today, unlike during the silent era, films communicate along three more dimensions besides the two visual dimensions of image and print and/or graphics. These three dimensions are speech, music and sound effects (or noise). Because sound tends to be always present and omnidirectional (unlike visual images which are always unidirectional) viewers tend to take the three sound dimensions of film, compared to the visual images, for granted; this is especially the case with the dimension of music because it is usually used intermittently in a film.<sup>5</sup>

Music in films serves many functions including the following: (a) It helps to situate the film in a given locale. (b) It helps to situate the film in a given time period. (c) It can be used to suggest the passage of time. (d) It can be used to evoke emotions in consonance with the story on the screen. (e) It can be used to accentuate specific action(s) taking place on the screen. (f) It can be used as simply a filler for sound (like program music in television or in documentaries).

Sound effects is the production and recording of noise for two basic purposes: (a) to enhance the reality-illusion of the film by adding relevant environmental sound (the ticking clock, the noise of

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<sup>5</sup> Visual images are unidirectional because our eyes can see only a direction at a time, and therefore forcing us to pay attention to whatever we are seeing. On the other hand our ears can hear sound from all directions and therefore we do not have to pay specific attention to the source of the sound. It is for this reason, among others, that television failed to dislodge the radio as a source of entertainment when it (television) first became available on a mass scale some 40 years ago. We can continue listening to the radio while doing other things; the same is not usually possible with television.

a thunderstorm, the whistle of a train, footsteps, and so on and so on) to the images and (b) to accentuate specific actions taking place on the screen. <sup>6</sup>

While the use of speech in films requires almost no comment (it constitutes an important dimension of reality-illusion) mention must be made of its one other use: it permits the film to enter more easily the world of the abstract (the subject's inner thoughts, ideas and feelings) where no real images exist to be photographed.

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## SECTION THREE

### Editing

Films are rarely, if ever, shot (photographed) in one continuous sequence. Instead they are shot in bits and pieces (sometimes over many days and in many different places) and then they are put together via a procedure called editing. Furthermore, a finished film can comprise hundreds of pieces of filmstock cut from the original film print and then rearranged to create a story. It is the editing more than anything else that can make or break the film. The film editor works with a number of basic film elements (building blocks) and techniques to put together a film; they include the shot, the scene, the sequence and the cut.

The shot is the primary building block that a film editor works with. At the visual level (as seen on the screen by the viewer) it is a cinematographic view that can last for the entire duration of the film or it may last for as short a time as a few seconds. At the physical level the shot is a strip of film print that the film editor works with. The print is derived from the film-maker's exposed filmstock which in turn was derived by running the camera without interruption during a single shooting session (an unbroken time period) regardless of movement by either camera or subject. In the film, shots are separated from each other by an image transition called a cut. The cut at the visual level is a splice of separate pieces of space and time as the narrative unfolds. From the perspective of the film editor, however, it is (usually) an actual physical cut in the film print where two pieces of the film print are spliced together.

When the film editor takes the shot and incorporates it into the finished film it is called a scene. The scene is then added to other scenes to create a sequence (which usually is a phase of a narrative). It is the sequence that contains the visual ingredients that the viewer puts together in his/her mind to create a complete thought, and thereby give meaning to the sequence. A simple

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<sup>6</sup> Incidentally, sound effects are almost always added to the film after the film has been shot by the sound editors in the editing room. These sound effects may or may not have come from the location where the film was shot.

film may have only one sequence, while a more complex film may have many sequences depending upon the complexity of the narrative.

While on the subject of sequences: attention should be drawn to a form of film editing called dynamic editing (or montage). In this type of editing the objective is to produce sequences that equal to more than the sum of their parts (scenes). The 'more' is the interrelationships among the scenes that the viewer is expected to conjure up in his/her mind. For example: take these two scenes: (a) a scene of a police car speeding with flashing lights on a city street and (b) a scene of a subject being led handcuffed into a holding cell inside a police station. When these two scenes are put next to each other in sequence (a), (b), the sequence would signify in the minds of most viewers that the personnel in the police car were responsible for the arrest of the subject who, presumably, has committed some offense. Yet, in strict objective terms, there is nothing visual in the sequence to suggest such an interrelationship because a number of intervening scenes are missing.

These scenes would include, among others, those that show: (1) the subject committing an offense; (2) the police making an arrest of the subject; and (3) the police leading the subject into the police station and booking him /her. Clearly the addition of (a) and (b) has produced an entirely new meaning--a complete thought--not contained in the two original scenes. This point becomes clearer if, instead, one imagines scene (b) being placed immediately before scene (a)--here the two scenes lose all connections with each other and become separate visual entities, each with its own separate ideational significance.

An aside: note something else about this 'police/subject' example: the viewer has to make the assumption that the setting for the film is a democratic society. A person living in a fascist society can very legitimately assume that the subject had been unjustly arrested (because in such societies arrests of innocent persons is routine). The significance of noting this point is that it underlines an important quality of films in general: despite the fact that we are dealing with visual images (which are, at least on the surface, readily apprehensible), films, unlike written language for example, are not an unambiguous means of communication. The viewer constitutes a very important element in the communication process of films. The film-maker must always contend with a high degree of uncertainty as to whether his/her intentions will be successfully communicated to the viewer given that the meaning the viewer derives from a sequence will also depend to a considerable degree not on what he/she is seeing on the screen but his/her past experiences, as well as, of course, his/her imagination. Clearly, when considering images on the film screen, apprehension does not automatically translate into comprehension.

Given that the shot is produced on the film set (be it in a studio, or on location, etc.), while the scene and the sequence is usually produced in the film editing room, it is in the different types of shots that the film-maker invests most of his/her creativity.

Some would dispute this statement, arguing that it is in the process of dynamic editing (or montage) that the film-maker truly invests his/her creativity. The counterpoising argument here would be that not all film-makers feel that dynamic editing is the best method of producing a

film. Some film-makers prefer the deep focus approach to film-making. (Comedies, especially, the slapstick type are particularly amenable to the deep focus approach.)

Note: Among the types of shots that film-makers work with include the following: the establishing shot, the two-shot, the reverse-angle shot, the close-up shot, the point of view shot, the reaction shot, the follow shot, the bridging shot and the long shot.

The establishing shot is usually a long shot, but with this specific purpose: it aims to situate the narrative of the film in terms of place and time-period. In other words, from the perspective of the viewer, it is a shot that allows continuity of space and time (by serving as a visual context for other shots). Via the establishing shot a master film-maker can provide us with such varied information as where the story is set (place), who the principle character(s) is/are, why the character(s) is/are in that particular place, how the character(s) came to be there, and so on. Establishing shots, however, do not always occur at the very beginning of the film. The film-maker may begin his/her film with close-ups and then introduce the establishing shot (often by zooming out to a long shot).

The two-shot is a shot of two people talking to each other, taken usually from chest upwards. This type of shot is a favorite among Hollywood-style film-makers. When the camera begins to take only one-shots of each of the two characters as they speak and listen in turn then these other shots may come into play: over-the-shoulder shot (the view from the speaker's perspective), the reverse-angle shot (the view of the speaker from the listener's perspective), and the close-up shot (a close-up view of the face of the speaker).

The point of view shot is simply the view from the perspective of the subject. The reaction shot is a close-up view of the subject reacting (usually without words) to events in the narrative. The follow shot is when the camera follows the subject (usually in a closed frame) as he/she moves about. The bridging shot is often a reaction shot that serves to bridge two shots separated by time and space. (For example a shot of an inebriated man, accompanied by his wife, drinking in a bar and another shot of him in a car accident may be 'bridged' by a shot of the reaction of his wife to his decision to drive when they are outside.)

The long shot (which is often a deep-focus shot) is the view of the entire scene. In general it can be said that in films where long shots are dominant, the film is more concerned with context rather than the drama between the characters. Where the reverse is true then two-shots and close-up shots will predominate.

## **Cinematic Time**

As just mentioned, shots are usually put together via the cut. The cut, however, should not be viewed as simply an aspect of splicing. In films the cut also has an expressive dimension: it can be used creatively to alter not only our perception of space, but also time. A good example is the type of cut called cross-cutting (or parallel editing) where two or more sequences of entirely

different, but related, parts of the narrative are alternately shown on the screen. (Soaps on television rely heavily on this technique.) Now, besides the fact that cross-cutting can be a very useful device for building suspense and drama, its most common use is for purposes of time alteration.

It is a paradox of films that even though their success (as films) ultimately depend on the quality of reality-illusion they evoke in the viewer, the reality-illusion is bereft of verisimilitude in precisely those areas that are essential to reality-illusion: space and time. Films alter our perception of space; this is quite evident from the discussion on lenses, screen size, etc. above. But in what way do they alter our perception of time? At the very simplest level notice that on average the real time in which a film is shown is usually between 100 to 120 minutes, yet the narrative itself may traverse a time period spanning several centuries. This compression of time in films is a result of the demands of the narrative.

More commonly, however, time compression (and expansion) in films is determined by the expressive needs of the film-maker. For example: a rapid succession of cuts (without bridging shots) can serve to compress time in the present. (As for instance in the dynamic editing example above.) If bridging shots are placed between an action and its consequence (e.g. when a number of different shots of people dying, running, etc. bridge a shot of an exploding bomb in a busy street and a shot of the street reduced to rubble), then present time can be expanded. The entire action in real time would have lasted only a few seconds but on the screen it is made to last several or more minutes. The slow-motion film sequence (made by filming at a faster speed than usual, e.g. 250 frames per second instead of the usual 24 frames per second) commonly used to heighten drama is another example of time expansion.

Another common example of time alteration is the inter-mingling of past time and present time (and sometimes even future time) with cuts of flashbacks. As the term suggests, flashbacks are film sequences of aspects of the narrative that took place in the past. Some films will consist almost entirely of flash-backs (e.g. *The Bounty* [1984], *Missing* [1982] and *The Mission* [1986]).

## **Special Effects**

There are some types of films, such as science fiction and horror films, that require creating a fictional world on screen that ordinarily does not exist on this planet. In such a situation the film-maker turns to mechanical and/or optical devices to produce 'special effects' on film that will help create this non-existing (but seemingly real) fantasy world. A good example of films that depended for their success (in terms of reality illusion) on such special effects are *2001: A Space Odyssey* (1968), *Alien* (1979) and the *Star Trek* and *Star Wars* films. Special effects are not restricted, of course, to these types of films. Today almost all major films will use some type of special effects. Even films such as *Dancing with Wolves* (1991) and *Out of Africa* (1985) resorted to some special effects.



The most common types of special effects are derived from: (1) the use of scaled-down models (as in the case of the opening sequence of the train in *Out of Africa*), (2) the use of mattes (as in the case of *Dancing with Wolves*), (3) the use of front/rear projection (as in the case of *2001: A Space Odyssey*), (4) the use of mechanical devices to create weather (rain, snow, wind, etc.), and (5) the use of the optical printer to create such effects as fades, dissolves, wipes, freezes, ghosts, multiple images, superimpositions and so on necessary for alerting the viewer to the impending drastic change in time and space in the narrative. (See the glossary for definitions of these terms.)

There are another type of special effects, though they are not referred to as such, but which work similarly to the effects just described. They result from the use of stand-ins and stunt persons (who are, in a sense, stand-ins too). A stand-in is a person who stands in the place of the main actor in some scenes of the film; but, of course, the viewer is unaware of this 'duplicity.' The purposes of this cinematic device include shortening the time that a high-demand main actor must spend on the set; permit the main actor to appear to be performing professionally (e.g. in scenes requiring singing or dancing); permit the main actors to appear to be more attractive than they really are (this is especially the case in scenes involving nudity); and allow the main actor to skip acting (for ethical or other reasons) in some scenes. A stunt person is of course the person who does the dangerous scenes (e.g. car crashes) in the film in place of the main actor.

The world of special effects, whether derived mechanically, optically or via other humans, needless to say, help to expand the frontiers of cinematic creativity, producing a reality-illusion that is twice removed. (That is, special effects are a reality-illusion within a reality-illusion). However, their use are not without an ethical dilemma (in cinematic terms) for the film-maker-- unless the film in question is of the type traditionally associated with special effects (e.g. science fiction films). To give two examples illustrating this point: some of the awe-inspiring panoramic views of the landscape in *Dancing with Wolves* were a result of the use of mattes; and some of the body parts of the main actors in *Pretty Woman* (1990) belonged to stand-ins. Film viewers who become consciously aware of this cinematic 'duplicity' in both of these films are likely to feel cheated.

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