

THE CHANGING POETICS OF THE DISSOLVE IN HOLLYWOOD FILM

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ABSTRACT

Most films contain many shots knit together by several types of transitions, and by far the most prevalent is the cut. Over the last 70 years, fades and wipes have become increasingly rare. Dissolves have also diminished in frequency but, unlike the others, they remain an important part of the general visual narrative and have shown a small increase in contemporary film. We tracked the usage of dissolves in 150 films released from 1935 to 2005. We found: (a) that after a lull between 1970 and 1990, dissolves have become more numerous, although not nearly so common as during the studio era; (b) that shots surrounding single dissolves are fairly long compared to the median shot lengths of a given film, suggesting visual preparation for scene change before a dissolve, and a re-acceleration after; and (c) that after their nadir, dissolves have increasingly reappeared in clusters reflecting a rebirth of the Hollywood montage. We also discuss the functions and meanings of these montage sequences in the stream of a film's narrative, with more contemporary films focusing on setups, altered mental states, and celebrations rather than older films' focus on travel and time gaps of various sizes.

The function of the dissolve is mainly to facilitate transition. In its simplest form it can carry us from one place to another or from one time to another. In complex clusters, such as the Hollywood montage, the dissolve is the filmmaker's "time machine," transporting the viewer instantly backward or forward in time and location at his will. In more sophisticated use, dissolves aid greatly in the manipulation of pace and mood. (Dmytryk, 1984, pp. 83-84)

Although the oldest films are composed of a single shot, almost all subsequent films have multiple shots. That is, at least in analog form, a number of continuous stretches of frames taken from different camera positions are placed together and run continuously through a projector without break. Historically, the earliest type of transition between shots was the dissolve. The dissolve is sliding double exposure originally produced within the camera by rewinding the film slightly between shots. With more modern techniques, the last frames of one shot are incrementally blended with the early frames of another, the first shot diminishing in contrast over time and the second increasing until only the latter remains.

According to Salt (2009) the initial primacy of the dissolve was due to its near identity to transitions in the magic lantern slide shows of the 19th century pre-film era (see also Bottomore, 1990; Rossell, 1998; Webster, 1999). For example, Georges Méliès, one of the most prolific early filmmakers and active from 1896 to 1913, always used dissolves as transitions between shots, whether those shots were from the same scene or different scenes (Salt, 2009). Most other early filmmakers followed suit. With this usage the dissolve has no particular meaning, or *poetics* as we will use the term (see Bordwell, 1989, 2007).¹ Since most shots in early films were, in effect, separate scenes, this pattern was a precedent for the use of dissolves in later films.

By 1915, the armamentarium of transitions used by filmmakers had grown. In addition to the dissolve there was the cut (an abrupt change from one frame to the next), the fade out and fade in (lowering luminance to black and then raising it on another shot), the wipe (the replacement of one shot with another by a progressive boundary moving across the screen),² and the iris out and in (the circular spread or collapse of a shot over black or another shot, essentially a circular wipe). To be sure, there are occasional white or colored fades (a fade to white or to a color other than black), rotational flips (like a window or mirror being rotated with one scene on one side and a second scene on the other), opening doors (where two halves of one scene split to reveal the next), morphs (where one object or person changes into another), and an untold number of digital effects that occasionally occur in contemporary films. In general, however, all of these appear idiosyncratically. Cuts, dissolves, fades, and wipes in that order have

¹ Bordwell (1989, p. 371) noted that “‘Poetics’ derives from the Greek word *poiesis*, or active making. The poetics of any medium studies the finished work as the result of a process of construction—a process which includes a craft component (e.g., rules of thumb), the more general principles according to which the work is composed, and its functions, effects, and uses.”

² The spatial boundaries of wipes in older films are never hard edged, and the first hard-edged boundaries on any transitions (opening-doors) in our sample occur with *What’s New Pussycat* (1965). Wipes in contemporary films tend to have a hard edge (e.g., *How the Grinch Stole Christmas*, 2000; *Wedding Crashers*, 2005). In contrast, the wipes prevalent in Stars Wars films (here *The Empire Strikes Back*, 1980 and *Revenge of the Sith*, 2005) have quite soft boundaries.

been the workhorses of cinema—with others forming the larger menagerie of possibilities rarely used.

Also, by 1915 transitions came to be used differently and came to have different putative meanings associated with them. General film structure with sequences and scenes also developed during this time, with scenes dividing into separate shots and multiple scenes coalescing into sequences. One perhaps overly tidy view of transition form and function was given by Lindgren (1963, p. 72):

The normal method of transition from shot to shot within a scene is by means of the cut which gives the effect of one shot being instantaneously replaced by the next. The normal transition from one scene to another is by means of the mix or dissolve which is always associated with a sense of the passage of time or of a break in time. A sequence is normally punctuated by a fade-in at the beginning and a fade-out at the end.

THE POETICS OF THE FIVE MOST PREVALENT FILM TRANSITIONS

More generally, a fade out and fade in were used to signal temporal ellipsis, usually a leap forward in time but also occasionally in flashbacks. As Lindgren suggested, they were also used to segment larger sections of film, much like the chapters in a book or acts in a play (Katz, 1991). Fades out were sometimes said to induce sadness (Carey, 1974), or at least provide breathing space for the viewer after high drama (Chandler, 2009).

Wipes were typically used to indicate change to a new scene or subscene, and rarely indicating a change to a new time (Mitry, 1990). They were in vogue in the 1930s and enjoyed later use in the films of the French New Wave and, later still, in those of George Lucas. Nonetheless, some theorists bemoaned the wipe. Balázs (1970, p. 143), for example, suggested that wipes were a sign of directorial “impotence” and a “barbarian bit of laziness . . . contrary to the spirit of film art.” A more neutral view comes from the “wipe” entry on Wikipedia (September 26, 2010), which states “a wipe, rather than a simple cut or dissolve, is a stylistic choice that inherently makes the audience more ‘aware’ of the film as a film.” Whether this is true or not, however, is unclear.

The iris in and iris out come in two forms. Early in the 20th century they were used like fades. For example, a filmmaker could use an iris in, with its narrowing field of view and black surround, as a substitute for a fade to black. D. W. Griffith used such irises copiously in the 1910s to begin or end almost any shot (Cook, 1981; Salt, 2009). Like the wipe, however, the irises evolved to separate scenes in its second form, often in parallel action. An iris out could reveal a second scene while it replaces the first one, both visible during the transition, while the iris in replaces the second with the first, taking the viewer back to the original. Such irises occur several times, for example, in *Mutiny on the Bounty* (1935). However, even the latter type of iris transitions were essentially gone by 1940.

Whereas fades separate scenes, dissolves physically knit them together. With the speciation of transitions in the early 20th century and as suggested by Lindgren (1963) above, dissolves were used to indicate smaller scale punctuation in the narrative, often to signal a nested structure such as the entrance into and exit from a dream or flashback. Initially they did not indicate a passage of time, but came to be used that way in the 1920s (Salt, 2009). Dissolves are said to induce “thought-like weightlessness” (Carey, 1974, p. 46) or “a melodramatic, durative timelessness” (Grodal, 1997, p. 271). They are the “most commonly used convention to indicate a mental state,” and thought to be “the ‘softest’ shot transition imaginable” (Verstraten, 2009, pp. 119, 215). And as noted by Monaco (1977, p. 192), “If there is a comma in film amongst this various catalog of periods, it is the dissolve . . . it serves a multitude of purposes. . . . It is the one mark of punctuation in cinema that mixes images at the same time as it conjoins them.”

Finally, and most prominently, there are cuts. Cuts were used as early as 1900 and by the 1920s to 1940s, as noted by Lindgren, they denoted a change within a scene. All other transition types continued to be used to signal change across scenes (Carey, 1974, 1982).³ Although many initially regarded the cut as disruptive (see Bottomore, 1990), cuts were discovered to be, and later designed to be, perceptually transparent and largely unnoticed by the film viewer. Indeed, even when given the task to detect cuts, viewers may miss between 10% and 50% of them depending on the type of cut (Smith & Henderson, 2008). Almost surely, all other transitions are more overtly perceived, with the filmmaker’s purpose to make the viewer notice that something has happened across time or space in the narrative. In other words, where the larger goal of Hollywood film became continuity and a seamless narrative, transitions other than cuts signal discontinuity, a fork in the path of an otherwise locally linear story line.

THE CHANGING UTILITY OF DIFFERENT TRANSITIONS

Carey (1974) analyzed the change in the use of various transitions between scenes in 36 Hollywood films from the 1930s to the 1960s, 12 each from adventure films, dramas, and comedies and 3 per genre per decade. In his sample films from the 1930s, dissolves and fades were equally popular and together were used 90% of the time to signal scene change. Wipes were used occasionally (9%), but the straight cut between scenes was rare (1%). By the 1940s, a gradual shift had

³ Dissolves are also occasionally used within scenes. In *Detour* (1945), for example, Vera (Ann Savage) walks and talks with Al Roberts (Tom Neal) explaining that she loves him but wants to go to Hollywood. Due to the extreme low budgets of B films, the several dissolves within the walk-and-talk are necessary because the actors are physically walking the same elevated plank several times in a small studio with heavy background fog. We thank Todd Berliner for this insight.

occurred. Dissolves and fades were still dominant, but the former were more than twice as frequent as the latter (64% vs. 27%), and wipes and cuts continued to be uncommon (5% and 3%, respectively). By the 1950s, dissolves were dominant (66%) but straight cuts began to be used more frequently (21%). During this decade, the use of fades to denote scene changes began to wane (13%) and wipes were gone (0%) from Carey's sample. And finally, in the 1960s, straight cuts between scenes were by far the most common type of transition (58%), with dissolves still prevalent (38%) but with fades vanishing fast (3%).

Carey's sample was relatively small, and his data are for transitions between scenes whereas in many films it is sometimes difficult to determine when a scene ends and a new one begins. Nonetheless, his data seem apt, with straight cuts making inroads as transitions between scenes and with the others becoming increasingly rare. One purpose of this article is to replicate and update Carey's (1974, 1982) analysis of the use of non-cut transitions of all kinds across films from the 1935 to 2005. But in forecast: (a) fades are quite rare in contemporary film; (b) wipes and other transitions are even less common and used only idiosyncratically; but (c) the dissolve has not gone away. Almost every contemporary film has a number of dissolves. How many? And what are they used for? Before answering such questions we need first to discuss our methods.

THE PROJECT, THE FILM SAMPLE, AND OUR MEASUREMENTS

This analysis is part of a larger project investigating the long-term physical properties of popular film. Cutting, DeLong, and Nothelfer (2010) parsed 150 films into their shots—10 films each from each of 15 years, every 5 years from 1935 to 2005. We then measured the fluctuations in shot lengths across each film, and found that since about 1960 these patterns have increasingly mimicked the endogenous fluctuations of attention as measured in psychological experiments. Through correlational techniques, Cutting, DeLong, and Brunick (in press) measured the changes in pixels across frames and found that the amount of visual activity (object, person, and camera movement) in films has increased linearly from 1935 to the present. We also postulated some limits on this visual activity as a function of pacing in films based on visual activity as a function of duration. And Cutting, Brunick, and DeLong (2011) found that shot lengths and transitions in films varied, at least in part, according to the four-act structure of films outlined by Thompson (1999). The online supplementary material accompanying Cutting et al. (2010) and Cutting, DeLong, and Brunick (in press) lists the 150 films and a number of their physical attributes.

Here we again employed our sample of 150 films. In what follows we briefly mention and discuss 66 of them, although all were part of our data analysis. Our corpus was culled from five genres spanning 70 years and consisted of 32 action films, 20 adventure films, 41 comedies, 47 dramas, and 10 animations as

generally determined by their first listed genre on the Internet Movie Database (IMDb, <http://www.imdb.com>). In general they were among the highest grossing films of their year (>1975) or among those seen by the largest number of people reporting to the IMDb. The numbers of films varied by genre across years due to changes in viewers' tastes. After previously measuring each shot length in the 150 films, we used transition frame numbers and a Matlab interface to go back through each film, check our previous work, and record the type of transition between all pairs of shots. These data form the basis of what we report here.

Transitions coded were: cut, dissolve, fade in, fade out, wipe, and "other" (iris outs and ins, frame flips, opening doors, morphs, etc)—yielding more than 170,000 transitions in all.⁴ Almost 97% of these are cuts. For this article, however, we were interested in the almost 5400 non-cuts across all films. Of these, 69% are dissolves, 22% fades, 5% wipes, and 4% others. No transitions in our sample were digital morphs that could only be accomplished with computer editing. Although there are suggestions, cited above, that the different types of non-cuts function somewhat differently in film, we will assume that they all function in essentially the same way—they change the otherwise continuous narrative flow of Hollywood film. Going beyond Dmytryk in the epigram above, the meaning of non-cuts in general, and dissolves in particular, is to change time, place, pace, or mood.

DISSOLVES HAVE GROWN INFREQUENT BUT HAVE NOT DISAPPEARED

What has happened to the dissolve over the past 70 years? The upper panel of Figure 1 shows their mean of median proportion as a function of all film transitions, including cuts, in our sample films by release year. The data are fairly noisy but, aggregated to the negative exponential (the top solid curved line, $R^2 = .75$, $t(13) = 6.24$, $p < .0001$), it is clear that dissolves have become strikingly fewer, falling from about 8% of all transitions in the period from 1935 through 1955 to about 1% from 1970 to 2005.

Nonetheless, *proportions* can be misleading. Films in our sample vary greatly in their number of shots. From 1935 to 1955 our films average only about

⁴All dissolves coded here were at least 15 frames long and typically much more. Smith (2006, p. 54n) reported that some contemporary films have "quick dissolves" as short as 2 or 3 frames. None of our films had such dissolves, although quite a few had digitization artifacts that created "quick dissolves" of this kind. Unlike analog film, digital frame rates are not always precisely 24 frames/sec. Instead, the 24p technology is 23.976 frames/sec, and if syncing is not done appropriately over the course of a film the mismatch in rates can create hybrid frames at many shot boundaries that may look like a quick dissolve in film originally created in an analog medium. If one looks closely at these films, one can also see digital blurring effects in frames within a shot, an effect with the same cause as "quick dissolves."

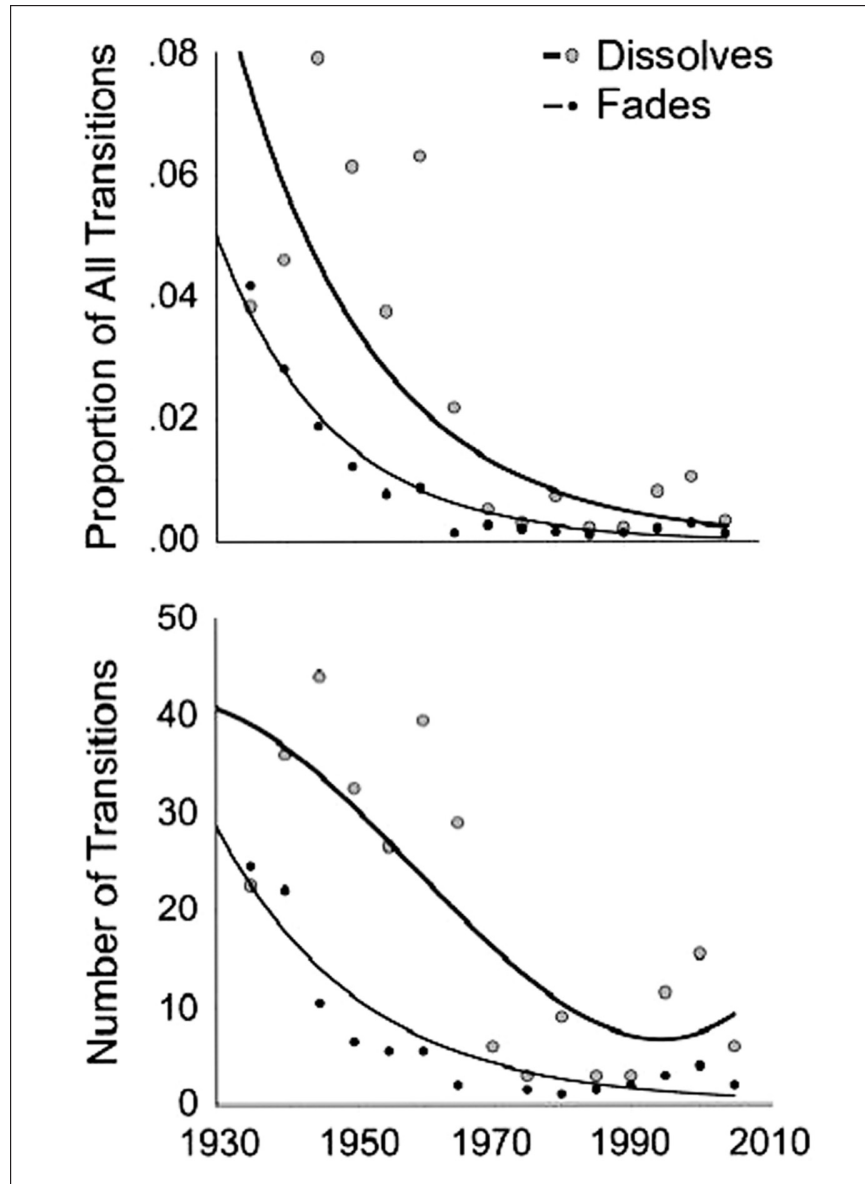


Figure 1. The upper panel shows the median proportion of dissolves (gray-filled circles) and fades (black dots) as a function of the number of all transitions (including cuts) in films by release year. The lower panel shows the median raw number of dissolves and fades in films by year. The recent modest increase in the number of dissolves is a central focus of this article.

670 shots, while from 1970 to 2005 they more than doubled to about 1400 shots. Moreover, those from 1970 average just less than 1200 shots and those from 2005 just over 1800. Because of this, we believe the median *number* of dissolves per film per release year should be considered more appropriate. These are shown in the lower panel of Figure 1. There one can see that dissolves have not disappeared from film; indeed, they have enjoyed a small Renaissance in recent years, although the uptick in the third-order polynomial fit to the data is likely to be overly enthusiastic.

To emphasize the 2-decade dearth of dissolves and other non-cut transitions, only four films in our sample—*M*A*S*H* (1970), *Barry Lyndon* (1975), *Dog Day Afternoon* (1975), and *Back to the Future* (1985)—have no non-cut transitions at all. In addition, only five other films have no dissolves—*Patton* (1970), *Tora! Tora! Tora!* (1970), *Shampoo* (1975), *Jewel of the Nile* (1985), and *Die Hard 2* (1990).⁵ All but one of these films is at least 25 years old. In other words, it appears that Hollywood filmmakers flirted with the idea of doing away with dissolves between about 1970 and 1985 but later found this too restricting, reinstating them as a useful narrative tool. In addition and perhaps at least as important is the advent of digital (“nonlinear”) editing in popular films beginning in the 1990s. With digital equipment the editor had more control and choices of transitions without the destruction of actual film footage. This allows for experimenting with different transitions in ways impossible when dealing with analog film, and may have encouraged the modest rebirth of the dissolve.

Nonetheless, dissolves remain relatively rare. Again, they make up only about 1% of all transitions in contemporary film (1990 to 2005 in our sample). But given that contemporary films average about 1800 shots or more, there may be as many as 10 to 20 per film. Thus, we claim that dissolves remain a significant part of visual storytelling. But before we elaborate on the story of dissolves, let’s consider first what happened to fades.

The Decline and Dissolution of Fade Pairs

Carey (1974) documented the decline of fades in an earlier era. The pattern in our data, shown in both panels of Figure 1, replicates and extends his finding. Fades have lost even more ground than dissolves, falling in their proportion with a negative exponential ($R^2 = .83$, $t(13) > 8.14$, $p < .0001$) from about 5% to a point where they almost disappeared after 1960. We should note, however, that we have counted the fade in and the fade out as separate transitions. In the minds of some, this strategy would overemphasize their frequency since many scholars

⁵ Not included in this second list is *The Empire Strikes Back* (1980), which has no dissolves but 35 wipes. We would argue these function the same way as single dissolves. Interestingly, *Revenge of the Sith* (2005) also has many wipes (28), but it also has two dissolves, suggesting a slight change in George Lucas’s attitude.

denote the pair as a single transition (e.g., Salt, 2006, 2009). After all, traditionally the fade out always followed the fade in. The reason we have counted them separately is that, although they were logically bound in pairs in traditional film structure, they have more recently become unglued. That is, before 1960 fewer than 20% of all fades were unpaired—a fade out was nearly always immediately followed by a fade in. The exceptions are nonadjacent, like the typical introductory fade in at the beginning of an older film and the final fade out at the end. Since 1970, and after the time when fades were beginning to disappear from movies, fully 70% of the remaining fades out are not followed by a fade in. Similarly fades in are sometimes not preceded by a fade out.

For example, in a number of films over the last 30 years the fade out (to blackness) is followed by a cut to a new scene. This happens in *Jewel of the Nile* (1985) where an evening love scene between Jack Colton and Joan Wilder (Michael Douglas and Kathleen Turner) fades to black and is followed by a straight cut to a bright scene the next day with the two of them trudging through rock-strewn desert. Similarly, in *Ghost* (1990) after a statement about the odd behavior of her cat, Molly Jensen (Demi Moore) walks *through* Sam Wheat (Patrick Swayze) followed by a fade out to black. A straight cut then starts the next scene, which takes place the next day in the same room. And a third occurs in *Erin Brockovich* (2000). After losing her job, Erin (Julia Roberts) is consoled by her neighbor George (Aaron Eckhart) and they kiss. There is a fade to black, a pause, a voiceover by Erin, and a cut to her re-enacting a beauty pageant. The reverse—a cut to black and a fade in—is less common in our sample, but one occurs in *Hitch* (2005). Near the end of the movie there is a wedding ceremony, and after it Alex “Hitch” Hitchens (Will Smith) makes a pronouncement to the camera that there are no basic principles to relationships. The scene then cuts to black but the next shot fades in to a line-dancing epilog among the wedding guests. Such adjacent pairs of transitions—fade out and then cut, or cut to black and then fade in—function in a film in the same way that fades pairs and dissolves have in the past, transitioning to a new scene.

Finally, the most common fade out-like transitions in contemporary movies are actually blackouts—for example, a shot may begin looking out from inside a closet showing an actor performing some action. This shot is lit only by exterior light and when the actor closes the door there is temporary blackness. This typically signals the coming of a new scene, which begins with a cut. This type of transition happens, for example, in *Cast Away* (2000) when the camera is mounted on a FedEx package at the end of a scene in Texas, the package placed in the back of a truck and the door closed. Two seconds later a door opens in the back of a truck in Moscow to begin a new scene.

To return briefly to the residual transition types, the other non-cuts have fared even worse than fades. Wipes, irises, and their kin have median proportions per release year uniformly of 0.1% or less throughout the 70-year period of our sample. Other than their idiosyncratic use by the occasional filmmaker, they either

effectively disappeared from cinema before the era we have investigated or they never really took serious hold in visual storytelling. Digital composites are now possible and will likely show an increase in future years as transitions of a new kind, but we think they are unlikely to rise above the frequency of dissolves and will likely be confined to specific genres (like action films).

The dissolve, in contrast, has been and continues to be used in films in many ways. In what follows we isolate two forms on the basis of their statistical distribution in the stream of transitions. First, as noted above, dissolves can be used singly, almost always to separate scenes. Second, they can be used in clusters often forming their own scene and used to indicate a dream, the thoughts of a protagonist, a change of mood, or simply the passage of time. Again, Dmytryk (1984) called the shots surrounding these dissolve clusters the Hollywood montage; Salt (2009, p. 194) called them the “classical” montage. Consider first the changes in the use of the single dissolve.

Single Dissolves

The upper panel of Figure 2 shows the median proportional use of single, isolated dissolves among all dissolves in films by release year. As it turns out, across the 70 years of our film sample, fully two-thirds of all dissolves occurred singly, but there was an increase in their proportional use from about 1960 to 1975, followed by a decline. The quadratic trend in the data is marginally reliable ($R^2 = .48$, $t(13) = 2.138$, $p < .052$). The peak overlaps with, but begins slightly earlier than, the period shown in the lower panel of Figure 1 during which the use of dissolves in general declined so markedly. Obviously, any proportional increase in single dissolves will detract from the proportion of dissolves in clusters.

What are the temporal dynamics around these single dissolves? Are dissolves simply stuck into the stream of cuts and shots, or are there adjacent temporal markers that accompany their use? To answer these queries we measured the shot lengths before and after all the single dissolves in our sample (almost 2000). We first assessed the *median* length of all shots in each of the 137 films that had more than one, single dissolve. We emphasize that these are medians, not means (averages), and that the usual measure of shot duration in film is average shot length (ASL; see, for example, Bordwell, 2002, 2006; Salt, 2006, 2009). We chose our measure because for smaller samples, which we deal with in the context of shots before and after dissolves, the median is generally a better measure of central tendency. It reduces the effect of outliers. We assessed next the median lengths in each film of the shots immediately prior to and just after each single dissolve. Then, for an intermediate measure between all shots and those adjacent to these transitions, we took the median length of the five shots just before and just after each single dissolve. We then had five data points for each film. In Figure 3 we plot six points, duplicating the whole film median shot value and plotting it on both sides of the other four measures.

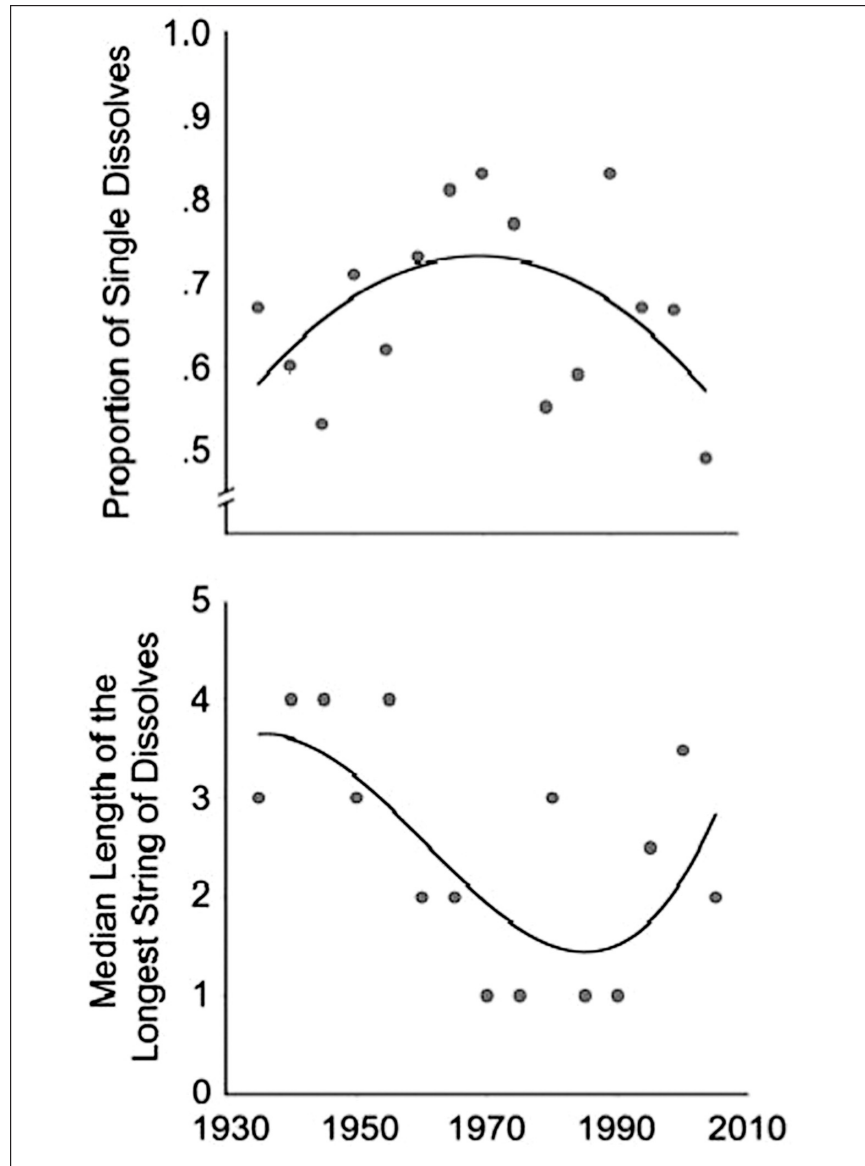


Figure 2. The upper panel shows the proportion of dissolves that occur singly by release year; that is, with a cut both before and after it in the sequence of transitions across the film. Data points represent the mean of 10 film medians for each of 15 sample years, 1935-2005. The lower panel shows the median length of the longest string of consecutive dissolves in films by release year. The uptick recently reflects the rediscovery of the Hollywood montage.



Figure 3. The median lengths of shots for the whole film, five shots before and after a single dissolve, and one shot before and after that dissolve. Error bars indicate plus and minus one standard error of the median. These data indicate that while single dissolves can indicate a scene change, the lengthening of shots before them may prepare the viewer for that change, and the shortening of shots after can accelerate the viewer into the new scene.

Notice first that the pattern of shot lengths is symmetric, before and after the single dissolve. Notice also that the shots immediately adjacent to the single dissolve are longer than the median of the five shots before and after ($t(135) = 11.84, p < .0001$), and considerably longer than the median shot length of whole films. This difference is not simply due to the fact that both adjacent shots contain part of the dissolve itself, since dissolves only occasionally last more than a second. In addition, the five shots before and the five shots after the dissolve are also longer than those of the whole film ($t(135) = 9.93, p < .0001$).

All of this suggests that dissolves are not randomly placed into the stream of the visual narrative. Instead, shots gradually lengthen before a single dissolve and then gradually diminish after it. It would seem that this increase in shot length prepares the viewer for a fork in the narrative, typically the end of a scene, and the decrease afterwards can be thought to accelerate the viewer into a new segment of the narrative stream. Finally, although it is well known that the ASL of popular

films has declined steadily since about 1960 (Bordwell, 2002, 2006; Cutting et al., in press; Salt, 2006, 2009), the general pattern shown in Figure 3 is essentially unchanged across the 70 years of our sample; all five categories of these shot lengths have diminished in concert.

A TAXONOMY AND THE RETURN OF THE HOLLYWOOD MONTAGE

The Hollywood, or classical, montage is “a sequence of short shots joined by dissolves or other optical effects that are so close together that one transition starts shortly after the one before ends” (Salt, 2009, p. 194).⁶ These montage sequences appeared first in German and French films in the 1920s and were adopted by Hollywood shortly thereafter. In our context and to be concrete, we defined such sequences as those shots that contain a string of at least three consecutive dissolves with no cuts or other transitions in their midst. Given that the probability of occurrence of a single dissolve is about 1% in our sample, the independent likelihood of three consecutive dissolves is about one in a million. Thus, filmmakers must have a clear purpose for stringing shots together this way. The analysis of those purposes is our next goal.

Across the 150 films of our sample, we found 162 clusters of dissolves in 70 different films. The lower panel of Figure 2 shows the median length of the longest cluster in each film across the 10 films by release year. As might be predicted from the data in the upper panel for the single dissolves, the trend in these clusters has changed over time. The third-order polynomial shows a distinct minimum in the period of 1970 to 1990 ($R^2 = .48$, $t(13) = 3.47$, $p < .005$), just about the same time shown in the lower panel of Figure 1 when dissolves were at a minimum in the films of our sample. Indeed, during this period of dearth for the Hollywood montage, none of our 10 films from 1970, only three from 1965, and only two from 1975 have any series of shots knit together with more than three consecutive dissolves. Importantly, since 1990 the number of dissolves has increased in the films of our sample and, comparing the two panels of Figure 2, that increase is largely due to the use of dissolve clusters. This increase, we suggest, indicates a rediscovery of the narrative utility of the Hollywood montage after about two decades of general absence.

⁶ Montage, of course, has come to mean many things in film. Stemming from the French “putting together,” Soviet montage sequences emphasized the juxtaposition of shots one after the other, where those shots were mostly separated by cuts. Here, we are emphasizing shots connected by dissolves. Still other kinds of montage occur. When two streams of images are superimposed, at least one stream has a series of shots strung together with cuts. This occurs in *Airplane!* (1980) in shots of Ted Striker (Robert Hayes) who has his daydreams of war plane battles, each shot pair separated by a cut, superimposed on his face. This type of montage was not considered in our analysis.

How do these montage sequences function in film? Most are covered with music rather than dialog and thus a clear narrative statement is being made. The music serves as a pause in verbal content, filled with sounds that set the mood for upcoming scenes and sequences. In a sense these Hollywood montages are a throwback to the purely visual cinema of the silent era, covered with music designed to complement the visual without the constraints of voice and verbal meaning. They are perhaps the strongest types of narrative punctuation that a film can have. Consider some prototypical examples from our sample, and then a substantial number of others that support a five-fold taxonomy. We start with the two suggested by Dmytryk in the epigram—travel in space and time.

Travel in Space

In *The Grapes of Wrath* (1940) the Joad family must leave their midwestern farm due to failing finances caused by the increasingly bitter Dust Bowl wind and dryness. The family sets off in their overloaded truck to travel westward from Oklahoma to their first roadside encampment. This travel is depicted in a sequence of 13 shots lasting about 38 seconds connected by 12 consecutive dissolves.

Such travel sequences provide the content for the most common dissolve clusters in our sample. These can depict travel on foot, whether trekking through mountains (*The Man Who Would Be King*, 1975; *Spies Like Us*, 1985), a winter wilderness (*Doctor Zhivago*, 1965; *Superman II*, 1980), the desert bush (*King Solomon's Mines*, 1950), or running through a tropical jungle (*Swiss Family Robinson*, 1960). They occur when riding on horseback (*Top Hat*, 1935), traveling in cars (*Night of the Hunter*, 1955; *Coal Miner's Daughter*, 1980), and hitchhiking (*Detour*, 1945); when traveling in small boats (*Thief of Baghdad*, 1940; *Night of the Hunter*, 1955; *Swiss Family Robinson*, 1960) or on-board large ships (*Battle Cry*, 1955); and when traveling in trains (*Annie Get Your Gun*, 1950) and airplanes (*Rocky IV*, 1985). Among older style films, some shots may include signs of the cities along the way (*Detour* and *Annie Get Your Gun*) or maps (*Coal Miner's Daughter*). There were 43 such travel sequences in our sample, although only five from 1980 through 2005.

Travel Across Time

After the shipwreck early on in *Blue Lagoon* (1980), the only surviving adult, the ship's cook Paddy Button (Leo Kern), sets about the task of educating the two surviving children, Emmeline (Brooke Shields) and Richard (Christopher Atkins), on how to survive on a remote tropical island. This months-long process is presented as a Hollywood montage. It lasts 105 seconds, covers 24 shots, and transitions that include 20 dissolves. Time and education are mixed.

Many such montage sequences display events distributed over a fairly large period of time. Classically, some of these are interspersed with looming,

front-page headlines overlaid on newspapers cascading through sorting machines. Such sequences can telescope the viewer across the gold rush and the settling of California (*Westward Ho*, 1935), or the decades between the two World Wars (*The Great Dictator*, 1940). Other films copy the newspaper gambit in a tighter time frame (*Blood on the Sun*, 1945; *Rocky IV*, 1985; *Dick Tracy*, 1990). Another, depicting a time antecedent to newspapers, shows the French Revolution from the storming of the Bastille through the Terror liberally enflamed with burning buildings (*A Tale of Two Cities*, 1935). Also in this group are collages of the long-term change in an individual, such as the months-long treatment of steam baths, massages, and facial treatments undergone by Norma Desmond (Gloria Swanson) trying to regain her past stardom in *Sunset Blvd.* (1950). Notice that in all of these the passage is conveyed by other things important to the narrative—information about world or personal events that occur during the telescoping of time.

There were 13 such large-scale temporal sequences among our films, but the most recent in our sample occurs in *Doctor Zhivago* (1965), where winter dissolves into spring. The remaining 36 temporal transitions shown in dissolve clusters were among shots that spanned a relatively brief period of time, and all less than a day. These are meant to add a small narrative touch beyond what a single dissolve might do. Interestingly, only two (discussed below) appear in our sample since 1965.

In *Rebel Without a Cause* (1955) there is a series of six shots and five dissolves lasting 15 seconds. These show many disembodied hands on telephones denoting the rapid spreading news of the death of one teenager in the context of a competition of driving cars toward a cliff. In *Detour* (1945) there is a similar montage of telephone operators failing to patch through a long distance telephone call. But almost all of the remaining sequences in this category have only four shots mixed with three consecutive dissolves. In *East of Eden* (1955), after a first dissolve there is a shot of a warehouse, another near a railroad loading dock, and a third of a train heading east with a shipment of California produce, reminding us of the major business of the community. Midway through *Charlie's Angels* (2000), each of the three female crime fighters is separately and temporarily distracted during a single evening by a romantic encounter. Each of these shots is followed by a dissolve. And in *Harry Potter and the Goblet of Fire* (2005) Harry moves from the awards tent to quaking in a cave. He is the fourth and last contestant in the first test, where he needs to capture the golden egg of a flying dragon. A voiceover in the sequence of shots elides over the first three contestants in a dissolve sequence.

Setups

The Perfect Storm (2000) begins with an 80-second sequence of nine shots linked by eight dissolves. It depicts the generally idyllic summer fishing life in

Gloucester, Massachusetts, and on the dockside around the Crow's Nest, the neighborhood pub. Such setups are quite often displayed as a Hollywood montage, showing the viewer the physical circumstances of the film's setting. Often these shots are at least partly overwritten with credits. In longer films, like *The Sound of Music* (1965), these sequences can also occur after or during intermissions. There were 18 setup montages in our sample and five in the release years of 2000 and 2005.

Altered Mental States

Spellbound (1945) contains perhaps the most famous dream sequence in Hollywood film. Dr. Constance Peterson (Ingrid Bergman) asks for a report of a dream of John Ballantine (Gregory Peck) whose guilt has forced him to impersonate a psychiatric physician. Designed by Salvador Dali, the dream report is presented as a Hollywood montage, a stunning 2.5-minute sequence of eyes, scissors, faceless men, blank playing cards, and chases. It has 12 shots and 11 straight dissolves.

More broadly, this third category includes many kinds of mental conditions other than the normal waking state. It includes daydreams (*Brief Encounter*, 1945; *Seven Year Itch*, 1955; *Popeye*, 1980; *Ace Ventura II*, 1995), nightmares and dreams (*Les Misérables*, 1935; *Detour*, 1945; *Rocky Horror Picture Show*, 1975; *Apollo 13*, 1995; *X-Men*, 2000), hangovers (*Lost Weekend*, 1945), vertigo (*Thief of Baghdad*, 1940), electric firestorms that take away mental powers (*What Women Want*, 2000), and the transition from orchestral reality to animated fantasy (*Fantasia*, 1940), and a life-summing song (*Walk the Line*, 2005).

Short flashbacks representing the memory of past events are also members of this category and are often bound in dissolves. One occurs when the Grinch (Jim Carrey) remembers his agony as an outsider in elementary school (*How the Grinch Stole Christmas*, 2000). Similarly, during a discussion among settlers having been pushed off their land in *The Grapes of Wrath* (1940), there is a montage of repetitive shots of tractors ominously plowing through dust as one settler explains the situation. Again, all shots are knit together by dissolves. In total we found 33 montage sequences of altered states in our sample, and six from 1995 to 2005.

Celebrations

Halfway into the animated film *Pocahontas* (1995) there is a song sequence by Pocahontas and John Smith. In nine shots, knit together by seven dissolves and one cut and lasting 18 seconds, the love of the two protagonists is sealed. And in *Pretty Woman* (1990) there is a montage cementing the relationship between the one-time prostitute Vivian Ward (Julia Roberts) and businessman Edward Lewis (Richard Gere) that takes place on horseback. This 21-second sequence is knit by eight dissolves.

There are several other kinds of such celebratory montage sequences in our sample. These include multiple shots of wedding bells mixed by dissolves (*Cinderella*, 1950; *The Sound of Music*, 1965), the installation of a new spiritual leader (*The Man Who Would Be King*, 1975), walking on the moon (*Apollo 13*, 1995), and the connection with a newfound love (*Mutiny on the Bounty*, 1935; *Lady and the Tramp*, 1955). Still others are tinged with other moods—the end of pirating sea battles with the destruction of ships interleaved with drum rolls (*Captain Blood*, 1935), or the celebration of sex and maturity on a tropical isle (*Blue Lagoon*, 1980). The much discussed kissing sequence in *To Catch a Thief* (1955; for example, see Messaris, 1994) between John Robie (Cary Grant) and Frances Stevens (Grace Kelly) is another. The kiss is followed by shots of fireworks mixed with dissolves. And in the animated film *Chicken Little* (2005) there is slow-motion montage of the protagonist succeeding in the unlikely event of hitting a baseball in a little league game, emphasizing the point of his critical change from frump to star. There were 20 such celebratory montage sequences in our sample, and nine from 1980 to 2005.

Although it is clear from the bottom panel of Figure 2 that the Hollywood montage has returned to popular film, it is also clear that, among the categories in our taxonomy, not all types of montage have returned in full force. Some recent montages occur early on in contemporary films, particularly during the opening credits. Others, just as they did during the studio era, are used for celebrations and dream-like states. However, there is a striking decline in montage sequences designating travel or the portrayal of events over large and small time gaps. Dividing the films into two groups (1935-1975 and 1980-2005) and looking at the number of setup, altered state, and celebration montages versus travel and temporal montages, the change in montage pattern for the two film eras is striking (43:82::26:11, $\chi^2 = 13.6$, $p < .0003$). It seems likely that travel and temporal lapse are now indicated with fewer than three dissolves or, perhaps more likely, by none at all—a shot of a jet plane can easily suffice. Such spatial and time jumps are often indicated satisfactorily through the dialog and juxtaposition across cuts in contemporary film. We find it ironic that the two uses of the Hollywood montage outlined by Dmytryk (1984)—changes across space and time—have essentially disappeared from modern film. What remains is the more “sophisticated use” that portrays changes in mood and pacing.

SUMMARY

We analyzed 150 films spanning 70 years and five genres, looking specifically at the transitions and their relationships to the shots they connect. Among the more than 170,000 transitions were almost 5400 that were not cuts, and we focused on the nearly 3400 dissolves. We discovered that the use of dissolves has not been historically uniform. Instead, they were used a great deal during the studio era (as much as 8% of all transitions), but shortly thereafter they

underwent a striking decline (1970-1990), only to recover a bit more recently (1995-2005) to about 1%.

We then documented two ways in which dissolves have been used—singly and typically separating scenes, and in clusters creating what has been called the Hollywood or classical montage. Single dissolves are typically surrounded by shots much longer than the median shot length of a given film, thus giving the viewer anticipatory information about a scene change with longer shot lengths and, once that change has occurred, guiding the viewing into the subsequent scene with incrementally shorter shots. As the use of dissolves in film declined (1970-1990), the Hollywood montage essentially disappeared while the use of a few isolated dissolves remained.

More recently, and perhaps at least partly attributable to digital (nonlinear) editing, the Hollywood montage has re-established itself as an important storytelling device. We documented five different ways in which these sequences have been used—to portray: (a) travel; (b) large and small scale temporal transition; (c) the early setup of a film; (d) altered mental states; and (e) celebrations of various kinds. However, contemporary film has generally eschewed the use of the montage for portraying travel and temporal gaps in the narrative. Instead, it has concentrated on setups, altered mental states, and celebrations. The reasons seem fairly clear. With the acculturating exposure to storytelling and personal travel, filmgoers no longer require extra information from the visual narrative that these changes have taken place. They can be triggered more simply and in other ways. On the other hand, setups, altered states, and celebrations present collages of images that, by running together across a series of dissolves, create mood and atmosphere in a way that cannot be achieved through simple juxtaposition of shots through cuts.

REFERENCES

- Balázs, B. (1970). *Theory of the film: Character and growth of a new art*. New York: Dover. (First published in 1945.)
- Bordwell, D. (1989). Historical poetics of cinema. In R. B. Palmer (Ed.), *The cinematic text: Methods and approaches* (pp. 369-398). New York: AMS Press.
- Bordwell, D. (2002). Intensified continuity. *Film Quarterly*, 55, 16-28.
- Bordwell, D. (2006). *The way Hollywood tells it*. Berkeley, CA: University of California Press.
- Bordwell, D. (2007). *The poetics of cinema*. London: Routledge.
- Bottomore, S. (1990). Shots in the dark: The real origins of film editing. In T. Elsaesser & A. Barker (Eds.), *Early cinema: Space, frame, narrative* (pp. 104-113). London: British Film Institute Publishing.
- Carey, J. (1974). Temporal and spatial transitions in American fiction films. *Studies in the Anthropology of Visual Communication*, 1, 45-50.
- Carey, J. (1982). Conventions and meaning in film. In S. Thomas (Ed.), *Film/culture: Explorations of cinema in its social context* (pp. 110-125). Metuchen, NJ: The Scarecrow Press.

- Chandler, G. (2009). *Film editing: Great cuts every filmmaker and movie lover must know*. Studio City, CA: Michael Wiese Productions.
- Cook, D. A. (1981). *A history of narrative film*. New York: Norton.
- Cutting, J. E., Brunick, K. L., & DeLong, J. E. (2011). How act structure sculpts shot lengths and shot transitions in Hollywood film. *Projections: The Journal for Movies and Mind*, 5, 1-16.
- Cutting, J. E., DeLong, J. E., & Brunick, K. L. (in press). Visual activity in Hollywood film: 1935 to 2005 and beyond. *Journal of Aesthetics, Creativity, and the Arts*.
- Cutting, J. E., DeLong, J. E., & Nothelfer, C. E. (2010). Attention and the evolution of Hollywood film. *Psychological Science*, 21, 440-447.
- Dmytryk, E. (1984). *On film editing*. Boston, MA: Focal Press.
- Grodal, T. (1997). *Moving pictures: A new theory of film genres, feelings, and cognition*. Oxford: Clarendon Press.
- Katz, S. D. (1991). *Film directing shot by shot: Visualizing from concept to screen*. Studio City, CA: Michael Wiese Productions.
- Lindgren, E. (1963). *The art of the film*. New York: Macmillan.
- Messaris, P. (1994). *Visual literacy: Image, mind, and reality*. Boulder, CO: Westview Press.
- Mitry, J. (1990). *The aesthetics and psychology of the cinema*. Bloomington, IN: Indiana University Press.
- Monaco, J. (1977). *How to read a film*. New York: Oxford University Press.
- Rossell, D. (1998). *Living pictures: The origins of the movies*. Albany, NY: The State University of New York Press.
- Salt, B. (2006). *Moving into pictures*. London: Starword.
- Salt, B. (2009). *Film style and technology: History and analysis* (3rd ed.) London: Starword.
- Smith, T. J. (2006). *An attentional theory of continuity editing*. Doctoral thesis. University of Edinburgh.
- Smith T. J., & Henderson J. M. (2008). Edit blindness: The relationship between attention and global change blindness in dynamic scenes. *Journal of Eye Movement Research*, 2, 1-17.
- Thompson, K. (1999). *Storytelling in the new Hollywood*. Cambridge, MA: Harvard University Press.
- Verstraten, P. (2009). *Film narratology*. S. van der Lecq (Trans.). Toronto: University of Toronto Press.
- Webster, C. (1999). Film and technology. In J. Nelmes (Ed.), *An introduction to film studies* (2nd ed.). London: Routledge Press.

FILMOGRAPHY

Listed are those films with Hollywood montage sequences or particular transitions discussed in the text with their classification and location from the start of the film. Also indicated are those films without non-cuts or without dissolves.

- Abrahams, J., & Zucker, D. (1980). *Airplane!* USA. Alternative montages: 10.3, 28.1, 67 min
- Algar, J., et al. (1940). *Fantasia*. USA. Altered states: 6, 12.5, 16.9, 43.8, & 117.7 min

- Altman, R. (1970). *M*A*S*H*. USA. No non-cuts
- Altman, R. (1980). *Popeye*. USA. Altered state: 79 min
- Apted, M. (1980). *Coal Miner's Daughter*. USA. Travel: 69 min
- Ashby, H. (1975). *Shampoo*. USA. No dissolves
- Beatty, W. (1990). *Dick Tracy*. USA. Large time change: 55.1 min
- Bennett, C., & Marton, A. (1950). *King Solomon's Mines*. USA. Travels: 29.5 & 78.5 min
- Berger, L. (1940). *The Thief of Baghdad*. UK. Altered state: 95.6 min; Travels: 19.5 & 21.6 min
- Annakin, K. (1960). *Swiss Family Robinson*. USA. Travels: 48.4 & 59.7 min
- Boleslawski, R. (1935). *Les Misérables*. USA. Large time change: 59 min
- Bradbury, R. (1935). *Westward Ho*. USA. Large time gap: 9 min
- Chaplin, C. (1940). *The Great Dictator*. USA. Large time changes: 16.7, 98.7, 136.2, 138 min
- Conway, J. (1935). *A Tale of Two Cities*. USA. Large time change: 75.2 min
- Curtiz, M. (1935). *Captain Blood*. USA. Celebration: 65.6 min; Large time change: 62.2 min
- Dindal, M. (2005). *Chicken Little*. USA. Celebration: 25 min.
- Dobkin, D. (2005). *Wedding Crashers*. USA; hard-edged wipes.
- Donner, C., & Talmadge, R. (1965). *What's New Pussycat*. France/USA; hard-edge wipes and opening door transitions
- Fleischer, R., & Fukasaku, K. (1970). *Tora! Tora! Tora!* USA/Japan. No dissolves
- Ford, J. (1940). *The Grapes of Wrath*. USA. Travels: 36.7, 51.6, 53.9, 58.1 min; Altered state: 15.8 min
- Gabriel, M., & Goldberg, E. (1995). *Pocahontas*. Celebration: 40.6 min; USA. Altered State: 64.3
- Geromini, C. et al. (1950). *Cinderella*. USA. Small time change: 38.4; Celebration: 73.1 min
- Geromini, C. et al. (1955). *Lady and the Tramp*. USA. Celebration: 48.1 min
- Harlin, R. (1990). *Die Hard 2*. USA. No dissolves
- Hitchcock, A. (1945). *Spellbound*. USA. Altered state: 86.7 min
- Hitchcock, A. (1955). *To Catch a Thief*. USA. Altered state: 70.8 min
- Howard, R. (1995). *Apollo 13*. USA. Celebration: 73.4; Altered state: 95.2 min
- Howard, R. (2000). *How the Grinch Stole Christmas*. USA/Germany. Altered state: 52.6 min; hard-edged wipes.
- Huston, J. (1975). *The Man Who Would Be King*. UK/USA. Travels: 8.9, 31.4, 37.7, & 42.7 min; Celebration: 14.7 min
- Kazan, E. (1955). *East of Eden*. USA. Small time change: 44.6 min
- Kerhsner, I. (1980). *Star Wars: Episode V - The Empire Strikes Back*. USA. No dissolves, soft edge wipes.
- Kleiser, R. (1980). *The Blue Lagoon*. USA. Large time change: 17.1 min; Celebrations: 66.8, 69.1, 70, 84.7 min; Travels: 92.2, 97.6 min
- Kubrick, S. (1975). *Barry Lyndon*. UK. No non-cuts
- Landis, J. (1985). *Spies Like Us*. USA. Travel: 60.5 min
- Laughton, C. (1955). *The Night of the Hunter*. USA. Travels: 3.4 & 60 min
- Lean, D. (1945). *Brief Encounter*. UK. Altered state: 49.3 min
- Lean, D. (1965). *Doctor Zhivago*. USA. Large time change: 20.5 min; Travel: 160.1 min
- Lester, R. (1980). *Superman II*. UK. Altered state: 72.7 min; Travel: 83.4 min
- Lloyd, F. (1935). *Mutiny on the Bounty*. USA. Celebrations: 58.9 & 69.3 min; 6 irises in 10 transitions, beginning at 34.6 min

- Lloyd, F. (1945). *Blood on the Sun*. USA. Large time change: 2.1 min
- Lucas, G. (2005). *Star Wars: Episode III—Revenge of the Sith*. USA. No dissolves, soft edge wipes.
- Lumet, S. (1975). *Dog Day Afternoon*. USA. No non-cuts
- Mangold, J. (2005). *Walk the Line*. USA/Germany. Altered state: 65.9 min
- Marshall, G. (1990). *Pretty Woman*. USA. Celebration: 90.5 min
- McG. (2000). *Charlie's Angels*. USA/Germany. Small time change: 46.3 min
- Meyers, N. (2000). *What Women Want*. USA, Altered state: 103.5 min
- Newell, M. (2005). *Harry Potter and the Goblet of Fire*. UK/USA. Small time change: 57.4 min
- Oedekerck, S. (1995). *Ace Ventura: When Nature Calls*. USA. Altered states: 70.4 & 72.1 min
- Peterson, W. (2000). *The Perfect Storm*. USA. Setup: .7 min
- Ray, N. (1955). *Rebel Without a Cause*. USA. Small time change: 77 min
- Sandrich, M. (1935). *Top Hat*. USA. Travel: 20.8 min
- Schaffner, F. (1970). *Patton*. USA. No dissolves
- Sharman, J. (1975). *The Rocky Horror Picture Show*. UK/USA. Altered State: 58.7 min
- Sidney, G. (1950). *Annie Get Your Gun*. USA. Travels: 31.7, 70.2, 70.7, 75.5 min
- Singer, B. (2000). *X-Men*. Canada/USA. Altered state: 40.8 min
- Soderbergh, S. (2000). *Erin Brockovich*. USA. Fade out then cut: 41.3 min
- Stallone, S. (1985). *Rocky IV*. USA. Travel: 8 min
- Teague, L. (1985). *The Jewel of the Nile*. USA. Fade out & cut: 73.8 min
- Tennant, A. (2005). *Hitch*. USA. Cut to black & fade in: 112.5 min
- Ulmer, E. (1945). *Detour*. USA. Small time change: 15.6 min; Travel: 17.4 min; Altered state: 36.5 min
- Walsh, R. (1955). *Battle Cry*. USA. Travels: 64.2 & 127.6 min
- Wilder, B. (1945). *The Lost Weekend*. USA. Altered state: 63.9 min
- Wilder, B. (1950). *Sunset Blvd.* USA. Large time change: 75.9 min
- Wilder, B. (1955). *The Seven Year Itch*. USA. Altered state: 65.3 min
- Wise, R. (1965). *The Sound of Music*. USA. Setup: 102.9 min; Celebration: 138.7 min
- Zemeckis, R. (1985). *Back to the Future*. USA. No non-cuts
- Zemeckis, R. (2000). *Cast Away*. USA. Black out replacing fade out: 2.5 min
- Zucker, J. (1990). *Ghost*. USA. Fade out & cut: 61.9 min

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