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Looking for Genres

The effect of film figure movement on genre recognition

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CONTENTS

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CHAPTER 1: INTRODUCTION

This dissertation reports a series of empirical studies on genre recognition and the nature of genre knowledge.

It is not difficult to recognize the difference between an angry person and a sad person by his body movements alone. Films use these movements in order to communicate emotions to the viewer, which is one of the main purposes of film. The viewer recognizes the intended emotions and becomes emotionalized himself and enjoys the film. Crucial in the viewing of a film are the expectations of the viewer. Viewers continue to watch a movie or any moving object, because of interest and curiosity: they expect something to happen and they want to know if these expectations will be fulfilled or violated. A major source for the forming of expectations is the genre of the film. For example, when the viewer knows he is watching a comic film, he will expect that the set goals of the characters are not achieved in the way the characters think they are, and the viewer will expect scenes that he can laugh about.

Genres thus are fundamental for the film viewer's perception of a film. But how does he know which genre he is watching? The viewer often knows the genre beforehand by so-called 'contextual information' of the film. This information might reach him by means of the title of the film, by prototypical genre actors, such as Arnold Schwarzenegger for action, Kate Winslet for drama, Jim Carrey for comedy, or the national news presenter for nonfiction. Contextual information is also provided to the viewer by third-hand parties, such as the genre labelling of video stores, television guides, movie databases, advertisements, movie reviews or recommendations by friends. However, this contextual information is not all there is to genres recognition. It may be assumed that a film labelled as one genre differs in both narrative and stylistical features from a film labelled as another. That films differ in their features as to genres provide material for genre labelling not only for expert film critics, but

also for non-expert viewers who can be expected to use these features in their decisions as to genre categorisation. For instance, when zapping through television stations, one generally knows within seconds to which genre a scene belongs. The present research will focus on the differences in stylistical features between genres and test their effect empirically on the viewer's genre categorisation.

The stylistic features by which movie scenes differ with regard to genres, can be best detected by comparing scenes depicting the same event but stemming from different genre films. For the present research I performed detailed analyses of chases and happy reunions from drama films, comic films, action films and nonfiction film material. Most of the fiction films were hired from video stores, and the nonfiction material was derived from the Netherlands Institute for Image and Sound in Hilversum. This institute has a large database containing all material broadcasted in the Netherlands from the 1950s onwards. An informal analysis of 'running chases' originating from the nonfiction, action, comic and drama genres will be presented below, as an example of how these genres differ stylistically in their representation of the same event.

1.1 An Informal Analysis of a Chase in Four Genres

The Nonfiction Chase

In nonfiction chases, the character that is being chased generally runs as fast he can. As can be seen in (nonfiction) athletics, fast running involves taking long and fast steps with few head and shoulder movements. As the distance between the chaser and the chased becomes shorter, the chased typically goes through an increasing number of bends that become shorter and more extreme toward the end of the chase. It can be supposed that the chased character makes these bends in order to distract the chaser's mental anticipation and complicate his movement (an object in motion tends to remain in motion in the same direction). In order to negotiate these bends at the right moment the chased has to look backward to estimate the distance separating them, and forward to assess when he has to go around a bend and vary his velocity. The chaser has an easier cognitive task, as he has to concentrate only on the chased person in front of him. Examples of a nonfiction chaser can be found

in sports, such as rugby (see Figure 1), in animal chases, or in police chases.

Figure 1. Example of a Chase During a Rugby Match.

Especially in the animal chase where a small animal is often chased by a larger animal, there is a large variation in the running velocity. The larger animal can run faster but is less flexible "sur place". The smaller animal runs slower but typically use his ability to vary his velocity abruptly, for instance by a sudden stop, in order to distract the chaser and escape – see Figure 2. In general, the movements in the nonfiction chases are often very detailed and dense, and typically filmed in one take.

Figure 2. Example of a Leopard Chasing a Fox.

The Action Chase

In action genre films the chase often occupies the central part of the film. Chases are therefore more lengthy and elaborate in the action genre than in other genres. This is achieved by a large variation in the means of transport (cars, planes, jumps, walks, etc.), by variation in the obstacles during the chase (stairs, rocks, roofs, rivers, etc.), by variations in the weapons used (guns, knifes, swords, sticks, etc.), and by labyrinth-like settings. The action hero can be characterized by a dominant display of physical power during the chase. It is noteworthy that action heroes typically take fast and short steps during the chase. Although this is not efficient, as large steps generally result in higher speed, the short steps produce more and faster leg movements on the screen, giving the viewer an impression of his spectacular physical skills.

Figure 3. Mel Gibson as an Action Hero in *Lethal Weapon* (1989).

The action hero also tends to keep his trunk and shoulders upright when running. This not only expresses fearlessness but also serves as a balance function: the action hero has a heavy muscular upper body and often carries heavy guns which require an upright body position to maintain balance – see Figure 3. This upright stance also facilitates negotiating inside bends, the action hero cuts short bends by leaning over to the inner side of the bend like an ice skater or motor racer - see Figure 4 in which this leaning effect is enhanced by a tilted camera.

Figure 4. Tom Cruise as Action Hero in *Minority Report* (2002).

The Comic Chase

In contrast to the upright running of an action hero, a comic character makes many horizontal movements when running. When running, the arms of the comic character often swing at his side, or he is carrying objects like an umbrella or a child - see Figure 5. This typical comic stance of horizontal body orientation is also reflected in the classic clown who wears large shoes and walks with his feet apart and turned outwards. When running, the horizontally oriented character gives the viewer an impression of inefficiency and lack of balance - sometimes leading to a comic confusion between arms and legs. The inefficiency of the running horizontal body is also apparent when it negotiates bends and parts of the body sway horizontally after the trunk. The inefficiency of negotiating these bends is enhanced by taking the outside bends instead of the inner ones. Another typicality of the comic chase is that it often encompasses a surprise effect: the comic character may encounter unexpected obstacles on his track which have to be overcome immediately. This unexpectedness facilitates the character's display of comic surprise and inventiveness, leading to impulsive uncontrolled actions, including fast and sudden body movements.

Figure 5. Charlie Chaplin as a Comic Hero in *The Kid* (1921).

The Drama Chase

A major difference between drama chases and chases from other genres is that in drama the goal of the chase is less obvious or less clearly defined than in other genres. Whereas a policeman in nonfiction tries to catch a thief, and action and comic characters try to catch the bad guy or a bag of money, the dramatic character in contrast tries to gain a woman's affection. This dramatic social and affective goal of the chase has consequences for the realisation of the chase scene: in drama the chasing man can often run faster than the chased woman, but when he is close to her, he talks to her and lets her go, after which he catches her again, etc. A chaser in drama is often very unsure how he can achieve his goal – in contrast to an action hero who knows exactly how far he has to jump in order to land on top of his subject. The doubt of the dramatic character is apparent through his slow and fluent movements and his arms hanging down beside him. This uncertainty of the character and the affective goal of the drama chase are also manifested by the use of much dialogue during the chase – see Figure 6.

Figure 6. Alain Delon and Annie Girardot as dramatic characters in *Rocco* (1960).

1.2 Research Aims and Questions

This dissertation aims to contribute to an insight in the genre knowledge of ordinary viewers. Viewers apply this knowledge for genre recognition during film viewing. Classical film theory, as a scholarly and critical discipline, tends to neglect and underestimate this genre knowledge of ordinary viewers. I want to demonstrate that the knowledge that film scholars have about genre is to a large extent also shared by regular film viewers, although the knowledge might be less explicit in the latter group.

Genre-typical events constitute only one key element of this knowledge. For instance, the sudden appearance of a magician is a typical manifestation for a fantasy movie. Most people will report some typical events, among other things, when asked to mention some characteristics of a particular genre. However, the analysis of 'the chase' in various genres shows that the particular filmic realisation of events may be another key element of genre knowledge. The particular realisation of any event, not just a chase, can also be a powerful cue to genre recognition. Although it may be difficult for ordinary viewers to verbalize filmic realisation properties, I assume that they share at least some of the knowledge that film experts, such as critics and scholars, have. The analysis of chase realisations may illustrate a focus on a particular aspect of filmic realisation, namely actor movement. My aim is to investigate whether it is an important cue for ordinary viewers in recognizing genre.

A more specific goal of the present research is to explore how body movements are used as a cue for viewers to categorize films in genres, and to gain insight into the organization of the viewer's genre

knowledge. To this end the following main research questions are posed:

1. Does the filmic realisation of an event influence the viewer's genre classification, and do specific actor movement patterns serve as genre cues?

2. Do viewers possess implicit genre knowledge and, if so, how is this organized?

1.3 Approach

The research reported here comprises a number of investigations into the use of genre knowledge in tasks related to actual genre recognition. The first research question is addressed by means of a series of empirical viewer experiments. The second question is addressed indirectly, inferring an answer from humanities theories of genre, and from a psychological model of the representation of knowledge relevant for genre recognition.

For the empirical studies, the stimulus material for the experiments consisted of captured and manipulated film and television material, as well as digitally animated scenes. Viewers' responses were measured by means of questionnaires. The judged genre fittingness of a stimulus scene was used as the main dependent variable in all experiments. Four genres were researched: comic, drama, action and nonfiction. Although many more genres exist (e.g. the natural disaster movie, the splatter or the chick-flick), it is assumed that this basic set of four genres form the origin of most subgenres. Thus, the comedy, drama, action and nonfiction genres are assumed to be more-or-less universal as to culture (e.g. they appear in Hollywood, European and Asian film cultures), as to history (e.g. the set of genres occurs throughout history), and as to the artistic media (e.g. the genres appear in literature, painting, film, television, theatre, games, etc.).

1.4 What's New?

The present research is innovative in that it combines cognitive research of emotions and classification processes, with film studies. Film studies are traditionally oriented towards the historical, philosophical and psychoanalytical domains of scholarship. However, during the last decade, insights from cognitive psychology have been increasingly used film studies (e.g. Anderson, 1996; Bordwell & Carroll, 1996; Grodal, 1996; Tan, in press). Still, the present research is one of the few experiments on genre recognition, and the only one on the effect of movements in genre recognition. The research presented here will provide an empirical basis for existing genre theory. Moreover, its results may be particularly useful for animation studies, in that it tests intuitively-based animation techniques scientifically. The research contributes to psychological theory by testing principles of categorisation and the organisation of genre knowledge. Finally, the results contribute to the domain of communication research and media theory, in that they elucidate how viewers can be cued to specific genre and emotive impressions.

1.5 Applications

The results of this dissertation may also be applied in various applications, such as in moving image production and recognition facilities. One can think of implementation in animation software whereby any animation scene can, for example. be turned into a prototypical "sad" or "nonfiction" scene by pushing the "sad" or "nonfiction" button. The results may be especially useful for animation of drama and nonfiction. These two genres are largely ignored in traditional animation production and theory, although especially nonfiction animations may be used for many goals, such as in educational and/or news productions.

The found movement prototypes for specific viewer impressions can be used for animators and film directors as basis from which to work on; or they can be used directly in games or web animations. Because the researched movement parameters operate at a very basic level, it can be expected that their effect can be more or less generalized to abstract movements as well; then the movements

can be applied to moving letters and objects in commercials and interfaces. Besides the described production of affective and generic effects, the outcomes of this research can also be applied for movement recognition purposes: digital image filters may be able to recognise and sort image movements according to their affective and generic content. Last but not least, when viewers are made aware as to how they are cued to specific genres and emotions, their media literacy may improve and they may become more alert to the communicative functions offered by the ever-expanding culture of moving image.

CHAPTER 2: THEORETICAL CONTEXT

2.1 Theory of Genre and Film Genre

2.1.1 What Are Genres?

Genres have been discussed for more than 2000 years. During all these years they have been used as classifications of artistic products ranging from poetry to paintings, and from music to theatre to film. Although genres have been effortlessly used all this time by art consumers and critics, several problems arise when defining genres. The first is that genre categories are not mutually exclusive: one and the same item may be classified in several different genres. For instance, a film like *Dancer in the Dark* can be categorized as a drama, a musical, and as a Dogma film. To overcome this theoretical problem of categories with fuzzy borders, Wittgenstein's (1953) concept of family resemblance is often used to separate the genres. According to this theory, a member of a category does not need to possess the same traits as the other items of that category, but all items share a group of traits. Moreover, some members of a category may possess a trait that other items of that category do not, but that members of another category do. For instance, *Dancer in the Dark* shares a plot of social dilemmas with other drama films, but also exhibits combinations of music and dance that do not appear in most drama films, but do appear as a shared trait in musicals. In each genre category some members possess more shared traits than other members; in other words, the goodness of category membership among the items varies within a genre. Such 'good members' are prototypes and are defined as "the clearest cases of category membership defined operationally by people's judgements of goodness of membership in the category" (Rosch, 1978). Genres can thus be seen as categories in which all members share family resemblances and are organized around prototypes (Maltby, 1995;

Swales, 1990). While the film *Dancer in the Dark* fits into three genres it is probably not judged to be prototypical for any of those genres as, for instance, *The English Patient* would be for drama, *Singin' in the Rain* for musical, and *The Idiots* for Dogma.

As stated in the definition of prototypes, the degree of prototypicality of an item depends on the viewer's judgement of goodness of membership. As a consequence, the prototypical items of a genre will change by culture and over time: *The English Patient* can be expected to be prototypical for a drama film in the 1990s, whereas *Casablanca* held the prototypical position in the 1940s. The characteristics or traits of the items that are held to be prototypical for a specific genre, for a large part define the genre. Genres depend on their prototypical items and thus can be expected to change in history. For example, nowadays a poem does not need to contain rhyming verse in order to be categorized as poetry. Genres thus change and develop over time, because their constituting items tend to change and develop. When new genre films are produced, they typically *repeat* plot and style characteristics of an existing genre but may also *vary* a little on the genre characteristics. In the repetition of generic conventions, the producer meets the viewer's expectation of the film and reduces his box office risks. Little variation of genre conventions, by associating new types of material with already existing genres, is needed to increase the viewer's interest and curiosity. Thus, the development of genres is described as a process of 'repetition and variation' (Altman, 1999; Bordwell & Thompson, 2004; Neale, 2000). The variation of existing genre conventions may consist of *adding* new components to a genre - such as a parallel virtual world to action movies like *the Matrix* (1999), *eXistenZ* (1999) or *the Thirteenth Floor* (1999) – or by *mixing* elements of different genres – such as horror and science-fiction in Aliens (1986) or comedy and action in Jackie Chan movies.

Genre cycles come and go in history: comedic action adventures (Indiana Jones/Crocodile Dundee films, both three film sequels) were popular in the 1980s but are nowadays seldom produced. The action-fantasy genre (*Harry Potter/ Lord of the Rings* films, respectively four and three film sequels) is at present among the most popular genres according to box office figures. But this genre will probably lose its top position in the coming decade – see Bordwell (2006) for the highest box office films of the last 46 years.

2.1.2 The Basic Genres: Aristotle

Although subgenres, like the action-fantasy or high-school comedy genre, come and go over time, grand or basic genres like comedy, drama, action and nonfiction seem to be used throughout history. A strong indication for the historical continuity of the basic genres is that Aristotle (335-323 BC/ trans. 1988) described comparable genres in his Poetics. Because of the striking similarities between the four basic genres and Aristotle's description of the epos, tragedy, comedy and historiography, I'll present his genres in some detail below. The film genre terms used are different from those used by Aristotle; for instance, he used the word 'drama' for the theatre medium that staged tragedies and comedies (for clarification of the terms see Zillmann (1998)). However, as shown below, Aristotle's genre terms can easily be substituted by the nowadays commonly used basic film genre terms: drama with tragedy, action with epos, nonfiction with historiography, and comedy with comedic play.

The tragedy and the comedy genre are described in most detail by Aristotle (trans. 1988). According to Aristotle, the tragedy has as function to elicit compassion and fear in the viewer. This is achieved by the display of human suffering and sorrow. The characters of a tragedy are generally related by family and possess a good and sympathetic nature. These characters lead a happy life at the beginning of the tragedy; however, due to a mistake made by one of the characters, in the end they suffer from misfortune. Scenes and actions in the tragedy need not be true to actual events, but they should be probable or necessary to the plot. By means of a strong rhetoric style, the tragedy can enhance the emotive impact and manipulate, positively or negatively, the importance of an event. The tragic plot has to have a unity of time, action and character. This unity is called for by the theatre restrictions; for instance, in a theatre it is difficult to present different events that happen at the same time. The main function of the unity is, however, to make the plot unambiguous and to achieve the optimal emotive effect on the viewer.

The function of comedy for Aristotle is to elicit laughter in the viewers. This is achieved by displaying mistakes or errors committed by the characters. The comic characters need not be sympathetic, but they have to be "less" good than the public. Typical comic characters

are the ironist, the bluffer, and the character who wants to be funny at any cost. Comedy may involve mocking but no sarcasm. The comic plot is less coherent than the tragic plot, and thus leaves room for surprising and absurd events. The language of comedy typically involves comically compounded words.

The written epos is a genre from which both the theatrical comedy and tragedy developed. Its characters and plot are much like tragedy characters and plot, although containing many more heroic elements, that link the epos more to the action genre than to the drama genre. Homer's *Iliad* and *Odyssey* are mentioned as examples of this genre. Another link to the action genre is that the plot of the epos has more room for surprising and inexplicable events than the tragedy has. The link of the epos genre to the action genre becomes even more apparent when Aristotle explicitly mentions the running chase as an event that fits well in the epos but not in the tragedy (Aristotle, trans. 1988, p.79/ XXIII, 60a11).

As the last genre, Aristotle describes historiography. He uses this genre, that describes historical events, mainly to point out its differences from the three fiction genres (tragedy, comedy and epos). The main difference is that historiography describes things that happened without a coherent plot structure: in historiography the events need not be related by necessity and probability, as in comedy and tragedy, but can be related by coincidence – as in reality. Moreover, historiography is free to describe everything that happened to one or several persons in a certain period of time; it is not limited to fiction's unity of character, action and time. Historiographical works consisting of descriptions of unrelated events, have the *particular* (acts of the character) as its subject. In contrast, fiction has the *general* and philosophical (motives of the character) as its subject.

2.1.3 The Basic Genres: Myths

Works that are classified into genres are classified as such on their characteristics. A fundamental division between the characteristics are those belonging to the content and those belonging to the form. This division is apparent in the analysis of various objects: language is divided between semantics and syntactics, painting in the represented and the representation, literature in story and style, and

film in the event and its filmic realisation. Of course, this division between content and form is often theoretically contested, mainly because the two parts can almost never function independent of each other: a specific content calls forth a specific form and vice versa. Nevertheless, although accepting that the division between form and content does not have a sharp border, it has proved useful in the analyses.

As mentioned, Aristotle already described genre characteristics belonging to the content, such as the tragic plot, and those belonging to the form, i.e. the rhetoric means by which the emotional effect of tragic events could be manipulated. How these two cue families are used by viewers in their genre classification, and which one is the stronger one, is presented in Experiment 1, Chapter 4. A psychological division between the cues will be made below in the discussion of psychological genre knowledge. The present section will describe the basic genre in more detail. But before turning to the characteristics of them, it will be useful to gain insight into the underlying stories of the basic genres, i.e. the myths.

Mythology is a "system of hereditary stories which were once believed to be true by a particular cultural group, and which served to explain why the world is as it is and things happen as they do" (Abrams, 1993, p. 121). Myths are the stories functioning in a mythology. Although myths have been described and used in theory and art practice since Plato and Aristotle, theory on mythology had a main boost during the mid-20th century. This revival is not only caused by the emerging field of anthropology, but also by the psycho-analytical theory of Freud and Jung. Freud believed that myth is "nothing but psychology projected into the external world" (quoted in Ruthven, 1976, p.18). Jung elaborated the psychological part of myth by applying the term *archetype* to "what he called "primordial images," the "psychic residue" of repeated patterns of experience in the lives of our very ancient ancestors which, he maintained, survive in the "collective unconscious" of the human race and are expressed in myths, religion, dreams, and private fantasies, as well as in works of literature." (Abrams, 1993, p. 223).

Probably the most influential theorist on myth is Northrop Frye. He presented not only the most advanced theory on myths, but also links myth to the four basic genres as they appear in this dissertation. Although Frye does not involve the Jungian collective

unconscious in his theory of myth, he does state that myth is a meaningful verbalization of archetypical rituals and dreams (Frye, 1957). These two components, the ritual and dream, are based in reality: dreams allude to the dreamer's own realistic life and rituals do actually take place in reality. Moreover, the link of myth to reality is apparent by its function to understand and explain the world of nature. It is therefore not surprising that the processes of life and death are fundamental to all mythological archetypes. From this "seedplot" (ibid.) of death and rebirth the four main genres emerge: romance, tragedy, comedy and satire.

The central myth underlying the four genres is the quest myth (Campbell 1949/ 1968; Frye, 1957). The four genres are described as episodes or archetypical themes (Frye, 1957) within the quest myth. The first stage of the quest would be 'conflict', which is also the basis of romance. The second stage is catastrophe or death, which is the central theme of tragedy. The third stage would be the "disappearance of the hero" or the "tearing to pieces" of any effective human action, this is the basis for satire. Finally, the rebirth or "reappearance of the hero in a newborn society" would be the theme for comedy (Russell, 2000, p. 114).

2.1.4 The Basic Genres: Characteristics

The genre characteristics described by Frye are very useful in order to appreciate the genres used in this research. In the current work I differentiated between the four genres: comedy, drama, action and nonfiction. Frye does not treat nonfiction as a genre, although he does treat the reality of nonfiction as the basis for the emergence of mythology and fiction genres – see above. The fiction genres discussed by Frye are romance, tragedy, comedy and satire. As will be shown below, Frye's concept of the romance genre is similar to the action genre in film, tragedy to drama, and comedy and satire to comedy film.

2.1.4.1 The Action Genre

The action genre became a major specific film genre towards the end of the 1970s up to the 90s, with *Raiders of the Lost Ark* and *Die Hard* as a prototype (Bordwell, 2006). However, the action genre as a basic action/adventure genre has its roots much earlier in history: it ranges from the Greek epos (e.g. *Iliad*), to the Mediaeval Arthurian Romances (e.g. *Lancelot*), to 19th century adventure stories (e.g. *The Three Musketeers*), to the beginning of film. The earliest film that was labelled action/adventure was *The Gaucho* by Douglas Fairbanks in 1927. Film subgenres that can be subsumed under the basic action genre are genres like war films, martial-arts films, disaster films, crime films, prison films, cop films, swashbucklers, pirate and jungle films, survival films, and even most westerns, thrillers and science-fiction films.

The action genre as a basic genre is termed in literary historical terms as the *romance*, and used as such by Frye (1957), but to avoid misunderstanding and confusion with the romantic films, I'll use the term action genre for romance. The central narrative theme of the action genre is a conflict between the hero and an enemy in which the hero triumphs at the end (a victory related by Frye (1957) to the ritual victory of fertility over the waste land). The action hero has to overcome obstacles and dangers to accomplish some important mission and receives, as a kind of side benefit, the favours of attractive ladies (Cawelti, 1976). The emphasis of the action genre is of course on the action scenes or the adventures making the action narrative episodic. Physical and spectacular action is favoured in action films over psychological conflicts and reflections (Arroyo, 2000; Neale, 2000) leaving the action hero relatively flat and psychologically undeveloped but dreamlike by his innocence, beauty and moral virtue (Frye, 1957). In action films, the characters typically have exceptional bodily skills and attributes that play a crucial role in the narrative (Bordwell, 2006). The action scenes are often very elaborated and virtuous in action films. They typically present big budget state-of-the-art special effects, athletic stunts and explosions (Neale, 2000). Hong Kong cinema initiated much visual stylistic conventions of the action genre like slow-motion fight scenes, florid colour design, unrealistic lighting, constant motion of camera and actors and staccato editing (Bordwell & Thompson, 2004).

The action genre usually aims at eliciting excitement by its spectacular scenes, so-called "whammoos" (Bordwell, 2006), and at suspense by focusing on the outcome of the quest event (Brewer & Lichtenstein, 1982; Carroll, 2003). The viewer's emotions in action films do not depend so much on deep empathy as on a sympathizing disposition towards the hero based on an understanding of the stakes involved in situations (Tan, 1996), moral approval of his case, the proportions of the challenges to be met (Zillmann, 1996), and his physical and mental superiority; e.g. the action hero always knows exactly which wire to cut to dismantle a bomb.

2.1.4.2 The Drama Genre

The tragedy of Frye, like the tragedy of Aristotle, is similar to the film genre called "drama" in popular culture and is used as such in the present genre recognition experiments. The basic genre "drama" encompasses subgenres like the tragedy, the melodrama, the social problem film, the melodrama, the male/female weepy, the costume drama, the family drama, and some of the romantic comedies.

According to Frye, the hero of a tragedy is typically a realistic and human-like character with a great sense of dignity that is achieved by courage or innocence. The tragedy hero typically falls, dies or is isolated at the end. This falling is caused by plot elements like external fate and sacrifice (Frye, 1957). Film theorists describe (melo-)drama characteristics along the same lines as Frye. However, a main difference between melodrama and tragedy is the ending. Tragedies typically have an unhappy ending while the drama genre not only encompasses films with an unhappy end, such as van Trier's *Dancer in the Dar*k, but also films with a happy end such as *Sense and Sensibility* or with an ambiguous end as in Fassbinder films (Lacey, 2000). The difference between unhappy-ending tragedy and good-ending melodramatic film can be found in their narrative depiction of the world: while both plots start with a gap between human desires and limitation of the (social) world, the gap is bridged in melodrama, revealing the rightness of the world, while the gap is widened in tragedy, revealing the unrightness of the world (Cawelti, 1976).

The narrative of drama is centred on interpersonal and/or social conflict (Lacey, 2000; Schatz, 1981) and therefore often has a

family as its narrative focus (Schatz, 1981). The characters of drama are serious characters that may know their weakness (Platz-Waury, 1980) and are recognizable (Lacey, 2000) and realistic (Neale, 2000). Moreover, dramatic characters are often uncertain about themselves, their intentions and their relation to other characters and it can take the whole film for the characters to make up their mind and fulfil their wishes.

The drama genre aims at provoking strong viewer empathy (Zillmann, 1998); an empathy that is enhanced by a strong sense of believability or realism (Pearson, 1992) and by overt focusing on the emotional states of the dramatic characters (Bordwell, 1985; Cordova, 2003; Lacey, 2000) and their interpersonal relationships (Carroll, 2003).

The falling of the tragic protagonist and her suffering of misfortune elicits a feeling of pity in the viewer (Carroll, 2003). This feeling of pity is enhanced by the often displayed naivety and innocence of the protagonists (Frye, 1957). Typically, the pity emotion is combined with a sense of admiration: the viewer admires how the protagonists negotiate their misfortune and often sacrifices himself for the benefit of others (Carroll, 2003) – sometimes described as dramatic "masochism" (Williams, 1991). The combination of these two emotions, pity and admiration, lead to the unifying emotion for drama, the bitter-sweet emotion (Carroll, 2003; Oliver, 2005): a combination of sadness and beauty.

2.1.4.3 The Comic Genre

Although Frye discusses the subgenres of comedy and irony, both share their emotional reaction of laughter and can be placed in the basic comic genre. According to Frye (1957), the comic hero is typically an ordinary man in his virtues, but socially attractive and sympathetic. However, satire comedy and slapstick typically portray misfits, eccentrics, and deviants of the conventionalized human perfection (too fat or thin, exaggerated features, or disproportionate body parts) (Carroll, 2003; Neale 2000). The comic hero usually gets his triumph at the end of the story, whether what he has done is sensible or silly, honest or rascally – comedy thus shows the "disappearance" or inexistence of efficient human action (Frye, 1957). Incongruity, surprise and complications are typical for comedy: we

expect the unexpected (Neale &Krutnik, 1990; Palmer, 1987). Chance, in the form of converging fates, is a central element in comedies: bad luck is typical for comedy and good luck or serendipity is typical for romantic comedy (Bordwell, 2006). Comedies have a happy ending achieved by a twist of the plot (Frye, 1957). The obstacles to the hero's desire form the action of the comedy, and the overcoming of them the comic resolution. Comedy often parodies the naivety of romances, morality, and conventional life and society (Altman, 1999; Frye, 1957; Mast, 1979; Palmer, 1987); for instance by ridiculing and scolding the audience that are hankering after sentiment and the triumph of moral standards, or by the portrayal of a chattering-monkey society devoted to snobbery and slander, or by showing the violence of a villain is less an attack on a virtuous society than a symptom of that society's own viciousness (Frye, 1957).

The comic plot often functions only as a "loose excuse" (e.g. Horton, 1991) to hold together a series of gags. Comic events are unspecific carriers of comic filmic realisations, consisting, for example, of actor movements that exaggerate small imperfections of normal behaviour to absurd proportions (Mast, 1979; Wells, 1998). The humour of comedy is founded on repetition, fantasy, the absurd and conventions (beloved mothers-in-law are not permitted to exist) (Frye, 1957). Humour stands together with horror on the opposite of beauty: whereas beauty is connected with a perfect realisation of concepts, horror and comedy are connected with a violation of concepts (Carroll, 2003). The comic can be characterized by a "departure from the norm" (Olsen quoted in Neale & Krutnik, 1990) or even leading to "a provocation of reality and turning the world into a jest" (Freud quoted in ibid.). According to the philosopher Henri Bergson, life and society require of people a "constantly alert attention that discerns the outlines of the present situation, together with a certain elasticity of mind and body to enable us to adapt ourselves in consequence" (Bergson, 1911/ 1999, p.9). This *tension* and *elasticity* of reality is typically provoked by the comic characteristic of *mechanical inelasticity*. Apart from eliciting laughter, the comic has a social function in that viewers can see the need to live their own social life with flexible rules instead of inflexible mechanical ones (ibid.).

2.1.4.4 The Nonfiction Genre

The nonfiction genre involves subgenres like filmic and television documentaries, news and reality programs. Nonfiction films are characterized by their attempt to present things as they happen or have happened in the actual world. Moreover, the nonfiction director is trusted by the viewer to stay relatively close to the actual world (Branigan, 1992; Nichols, 2001; Ponech, 1999). However, a nonfiction film will never be a direct copy of the actual world; the nonfiction film transforms the actual world because of two representational limitations: one technical and the other heuristic. To start with the latter, "the actual world, our relationship to it, and the constraints of rational discourse sets limits on what we can truthfully and honestly show, say, and imply" (Plantinga, 1997, p. 220). Moreover, behind most nonfiction films is the intention of the director to have an impact on the actual world via the viewer (Nichols, 2001). Nonfiction films show a specific view of the actual world and persuade the viewer of the truth of this view. Most nonfiction films are therefore essentially argumental in their structure (Nichols, 2001) and the images nonfiction films present are merely an illustration for the argument (Mac Cabe quoted in Hallam & Marshment, 2000). The second limitation for nonfiction films to capture the actual world directly, is the minimal inevitable technical transformation of reality, which is inherent in filmic medium. Each filmic image transforms reality as least as to size (both faces and mountains are screen size), dimensionality (2-dimensional instead of 3-dimensional appearance), frame (the director has to choose what falls within and behind the frame), movement (24 frames per second instead of continuous movement), and time (films are time bound while the actual world is continuous). Essential senses like smell, touch and taste, by which we perceive the actual world, are eliminated in a filmic representation. These kinds of limitations form the minimal degree of transformation involved in making a filmic representation of the actual world. However, the list of technical limitations is expanded by the wishes of nonfiction directors to make a "good" film: for instance, almost all nonfiction films are edited in scenes and sound in post-production. Moreover, while happenings in the actual world usually do not repeat themselves, nonfiction directors cannot always take their time in shooting the scene, and are often limited in their freedom of choice

between shooting options. This results in nonfiction representational characteristics like the use of hand-held camera, follow-on action shooting, found sound (Hallam & Marshment, 2000), a low cutting rate, signs of limited control of mise-en-scène, e.g. more random or non-goal-directed movements of actors (e.g. Ashida, Lee, Allbeck, Sun, & Balder, 2001) and less outspoken emotional expressions (Oatley, 2004; Tan, 2005).

Moreover, nonfiction directors try to present filmic realisations as looking unmanipulated, in order to let the events "speak for themselves". Film viewers, on their part, are familiar with the stylistics of nonfiction because they know these from the ubiquitous supply of all kinds of reality television shows. Familiarity is so high, indeed, that it can be put to use in other genres for purposes of make-belief. Examples of the genres are fictional documentaries (e.g. "mockumentaries") like Welles' radioplay The War of the Worlds (1938) or the Blair Witch Project (1999) and documentary fictions (e.g. "faction") like United 93 (2006) or Spielberg's "Munich"(2005). Moreover, the nonfiction stylistics are also frequently used in art house films and were even prescribed in the Danish Dogma movement.

2.1.5 Fiction versus Nonfiction

Nonfiction film is, as described above, a transformation of reality created by technical representation limitations and by intentional communicative purposes of the directors (Corner, 1995). However, nonfiction film is still defined by its assertion to maintain a direct reference to reality (Plantinga, 1997). Fiction film, in contrast, does not have to maintain such a direct reference to reality. Moreover, the nonfiction transformation of reality can be seen as an unwanted and unavoidable reduction of objectivity, while the transformation of reality in fiction is seen as the source of aesthetic pleasure and meaning (Singer, 1998). According to diverse art theories, the main characteristic of fiction and art is that it is not an exact copy of reality, but a transformed or creative one (e.g. see Auerbach (1946/ 2003) for an extensive description on "mimesis" theories). Russian Formalism saw the transformation of daily life – "estrangement" as the main purpose of art, because it would lead the viewer to see his daily life

from a new perspective (Shklovsky, 1929/ 1990; cf. Schram (1985) for a study on the aesthetic effects of textual estrangement procedures on readers of fiction). The enhanced distance from art and fiction to reality leads to a referential chain of fiction to reality that is characterized as typically "partially determined" (Branigan, 1992) and "complex and redundant" (Goodman, 1984).

      Huge transformations of reality into art and fiction can be seen in mythological figures like centaurs, unicorns and giants, and even in the biblical stories. Abstract and surrealistic painting deliberately transformed reality in their art. Film plots often seem to be based on events that could have occurred in reality but which specific aspects are transformed according to the demands of the film genre, the intended emotion (Grodal, 1997; Tan, 1996) and in general to make the events more interesting (Martin, 1986). Comic films will focus on events that make viewers laugh, drama on sad and beautiful events, and action on exciting events. On a small scale, fiction films also transform reality as to the director's intention to intensify his communicative purposes. Bordwell (2005, pp. 38-39) notes for instance that in fiction films, actors look steadily at each other far more often than people do in everyday life. Moreover, this steady look is intensified by a reduction of the eye blinking rate in fiction films. When viewers see this acting in the cinema they will find it normal and probably even realistic, but when the viewer sits next to someone in the cinema who has the same kind of steady look and minimal blinking rate, the viewer will probably regard him as a freak. However, the extent of the transformation of nonfiction to fiction is carefully limited. Some nonfiction aspects should remain relatively untransformed in the fiction to maintain essential viewing processes like perception, conceptual recognition, identification, narrative understanding, empathy, and the forming of expectations. When the transformation is very large, for instance in abstract film, these essential viewing processes can be violated resulting in a loss of the interest of the average viewer. The next section presents an outline of how viewers perceive and experience a film, and a genre, psychologically.

2.1.6 Does Viewer Knowledge Reflect Genre Theory?

I assume that the theories of film genre presented above have some general psychological reality. By this I mean that the knowledge of genre possessed by ordinary viewers reflects a number of analytical properties that can be found in genre theory as proposed by theoretical and critical experts. They include:

1. There are a number of basic genres, including action, drama, comedy and nonfiction as outlined above.
2. Fiction genres are transformations of reality by the film maker with the aim of creating heightened interest and emotion in the viewers.

Finally, the theory of genre accounts for the intuition that there is a close relation between genre and emotion. As is shown, the basic genres seem to be specialised in presenting a view of (some) reality-provoking emotion of one kind or another. A characteristic of drama is its potential to move and incite pity; one of action is to impress viewers and provoke admiration. Also, the aesthetic experience of one genre differs from that of another. A general agreement seems to exist as to the beauty of drama and a related lack of beauty inherent in comedy. The emotion potential and aesthetic repertoire of genres was not a central issue in the current project, but will function as a background assumption, addressed in one of the empirical studies.

2.2 Psychological Theory of Genre Knowledge

This section presents a brief account of all psychological theories relevant for this dissertation. This theoretical context will be used as a basis to answer my research questions about the role of filmic realisations and specific actor movements in viewers' genre classification, and about the organisation of viewers' implicit genre-knowledge. First, the perception of movement will be described, then the psychological attribution to movement perception, such as emotions or intentions, and finally the perceptual simulation theory of mind, explaining how processes of categorisation are grounded in multimodal perceptions. I will also present three main hypotheses which are forwarded as tentative answers to be tested empirically.

2.2.1 Movement Perception

Moving objects grasp our attention much faster than do static objects. This seems to be true based on daily life experience. For example, the fascination most people have for water in motion, or the effort needed to concentrate on social talk when a television is playing in the background. Although the 19th century psychologist William James (1890/1950) stated that moving things attract attention, the claim could only be roughly validated in psychological research during the 20th century. It is shown that not movement per se attracts attention, but that only motion onset is responsible for capturing attention (Abrams & Christ, 2003). However, stimuli in motion significantly facilitate cognitive tasks, especially detection tasks (McLeod, Driver, Dienes, & Crisp, 1991; Vuong, Hof, Bülthoff, & Thornton, 2006).

Perceiving objects in motion not only grasps attention but, conversely, requires attention to detect the moving object and categorize the motion. Familiar motions demand much less attention to process and recognise than unfamiliar ones. Cavanagh, Labianca and Thornton (2001) explain this difference by the perceiver's usage of visual *sprites* (stored mental representations of motions that are accessed by attention when viewing dynamic scenes; in other words, visual templates for prototypical movements). The sprites are built up

by repeated exposure to a pattern, so familiar movements such as a normal opening car door require less attention than unfamiliar ones.

A complex set of sprites would be responsible for the "robust perception of biological motion" (Scholl, 2001) as demonstrated in the classic motion capture experiments of Johansson (1973). In these experiments, about 11 small lights were attached to the major joints of an actor. Then the actor was asked to walk, run, dance, etc. and only the movements of the 11 lights were video-recorded. Recognition experiment showed that this limited visual information of the captured video was enough for the participants to decipher "without hesitation" a "walking man" (ibid.). Later, researchers have used the point-light technique to show that subjects could easily decipher the gender of the walking person (Barclay, Cutting & Kozlowski, 1978), recognise the expressed emotions (Dittrich, Troscianko, Lea & Morgan, 1996; Pollick, Paterson, Bruderlin & Sanford, 2001; Walk & Homan 1984) and even recognise deceptive intentions of the motion captured actor (e.g. a male walking like a female, or lifting a light box while acting as if it is heavy) (Richardson & Johnston, 2005; Runeson & Frykholm, 1983; Stevenage et al, 1999). Johansson (1973) also showed that even parts of a walking body, like a video displaying only one step or only the horizontal movements but not the vertical ones, provided perceivers with enough information to recognise biological motion. Viewers infer and fill in the visually missing bits of their perception by their sprites. When the stimulus movement is very familiar, as in biological movements, the inference will be faster.

The perception of biological movements and human bodies forms a special case in our perception of the world. Neuroimaging studies showed that humans process body movements and their parts (mouth, hand, eyes) in a specialised brain area, called the superior temporal sulcus (STS region) (Allison, Puce & McCarthy 2000; Beauchamp, Lee, Haxby & Martin 2003). This STS region interacts with the amygdala when processing complex body movements and their emotional salience. Recent neurological research showed that the STS processing of biological motion is more sensitive to human-form cues than to temporal motion cues (Hirai & Hiraki, 2006). These form cues are suggested to be part of a mental representation of the human body used when perceiving movements of a human body (cf. Thompson, Clarke, Stewart & Puce, 2005).

2.2.2 Movements as Cues

Probably the most important function of perceiving biological motion is to infer intentions of the body you see: is the body aware of me, is it a threat, or does it want a specific social interaction? Movements act as a cue for perceivers to make inferences, ranging from very elementary properties such as size (Jokisch & Troje, 2003) of the moving body (e.g. is it a tiger or an ant) to sophisticated properties such as the mentioned deceptive intentions. A first decision the brain makes is whether perceived movement is biological or not.

Since the classic experiments by Heider & Simmel (1944) and Michotte (1963) experimental psychologists have tried to find the cues that led perceivers to attribute animacy to a movement – see Scholl and Tremoulet (2000) for an overview. Only recently, the minimal conditions for the attribution of animacy have been formulated by Tremoulet and Feldman (2000). They found that when an object changes its speed and at the same time its direction, it is already perceived as animate. Another movement cue for animacy involves the presence of a goal: objects moving to a goal are perceived as much more alive than aimlessly moving objects (Opfer, 2002).

If movements are perceived as being biological or living, their neural processing will take place in the STS region. Perceivers will attribute personality traits and emotional states to the moving object (Heider & Simmel 1944; Michotte, 1963), as well as intentions (see Blakemore and Decety (2001) for an overview) and attractiveness (Grammar, Keki, Striebel, Atzmüller & Fink, 2003). This potential of movements to account for such a diverse range of viewer attribution and perception modes, suggests that movements are likely to play a major role in the perception of film, its emotive appraisal and its genre classification. As discussed in section 2.1 about genre theory, film genres are for a large part organised around genre typical emotions (Aristotle, trans. 1988; Carroll, 2003; Grodal, 1997). Film is an "emotion machine" (Tan, 1996). In addition, film viewers have the ability to recognise expressed emotions from body movements (Dittrich, Troscianko, Lea & Morgan, 1996; Meijer, 1989; Walk & Homan, 1984). Third, viewers have been demonstrated to be inclined to attribute emotions to abstract movements (Heider & Simmel, 1944; Michotte, 1963). These three theoretical and empirical findings argue for my first general hypothesis:

H1: Movement acts as a cue for film genre recognition.

2.2.3 Events and Intentions

One of the main reasons for the wired-in specific processing of biological motion is to predict the future actions of the perceived living object. The future actions of another living being can be predicted best by inferring its intentions. Intentions can be globally defined by the following three questions: what is the goal? what is the plan to reach it? and, how much does the being want it? (Malle, Moses & Baldwin, 2001). Although questions like these seem to be only answered by top-down higher-order conceptual inferences, there is growing evidence that they are also answered by perceptual bottom-up processes (see Blakemore and Decety (2001) for an overview) such as neurological simulation – these will be described in section 2.2.5.

Crucial in the viewer's attribution of an intention to something or someone is the ability to segment the incoming stream of perceptions into units. These units can then be categorised, stored in memory and be used to infer intentions of the actors. Psychological experiments of the 1970s by Newtson (1973; Newtson & Enquist, 1976) showed that viewers are surprisingly consistent among each other in their segmentation of a video-filmed scene; they all place their demarcation points of the units at the same moments in the film. Newtson concluded that the different units all contained different "meanings" and correspond to distinctive changes on the screen, such as bodily shifts in the actor's position. Later experiments (Baird & Baldwin, 2001) on segmentation of ongoing action, explained the difference between the units in terms of different inferred intentions – e.g. when the actor stands up to reach for a box of matches, people do not place a breakpoint because of the changed bodily position of the actor but because of a changed intention of the actor (wanting to get the box of matches).

As said, these action units do play a crucial role in the understanding of our perception. We use the units to differentiate between attributed intentions and also to make expectations about future actions and their results. For instance, if an actor pulls out a cigarette from a packet, looks around and sees a box of matches on a

cupboard, we expect him to get up from his chair to reach for the matches. Thus units, like the actor seeing the matches, are often part of a larger scene or event. The structure of the events, their scheme, is carefully scripted in the viewers' knowledge and memory. Viewers use such schemes not only to understand other people's action and infer their intentions but also to decide on their own actions. For instance, if we go to dinner in a restaurant, we will first wait for a table, then ask for the menu, choose something, wait for our food, don't talk or cry too loud while eating it, pay and tip, and leave with a smile. The usage and structure of schemes for acting in the world, for understanding the actions of other and for the forming of expectations has been described extensively in psychological theory (Bartlett, 1932; Miller & Johnson-Laird, 1976; Schank & Abelson, 1977). An account of the necessity of story-like schematic structures in comprehending series of cinematic units can be found in Hochberg and Brooks (1996)

For the present dissertation, the segmentation of a film in "meaningful" units is important in that these units constitute *events* as defined by Zacks and Tversky (2001): "a segment of time at a given location that is conceived by an observer to have a beginning and an end". Such events do play a major role in genre recognition because they are fitted in the viewer's story schemata (Mandler, 1984). These schemas activate genre-specific mental models, which in turn enable viewers to make inferences about the content, order and outcomes of events to come (Zacks & Tversky, 2001). In film viewing, events are also understood as parts of a larger narrative structure. This structure is probably to some extent genre specific.

2.2.4 Event Cues and Filmic Realisation Cues

The classification of a perceived film scene into a specific genre might be of more importance for the viewer than would appear at first sight. By classifying scenes in a genre, the viewer not only labels his perception, but genre classification might also prime the viewer's attention (Roskos-Ewoldsen & Dillman-Carpentier, 2002): without consciously knowing, the viewer looks longer and more intensely at a scene when it is classified in a genre he likes. Genre categorisation also affects the viewing style: viewers apply a so-called

monitoring look (briefly deciding if a television program requires attention) more often when viewing drama and news than when viewing comedy (Hawkins, et al., 2005). Film genres can be expected to influence the subject of the viewer's attention; in action films viewers will focus on the spectacular stylistic effects, while in drama films viewers will focus on the represented emotions of the character. Experiments on textual genre processing have shown that readers pay attention to the specific characteristics of a genre: when reading literary texts, readers attend especially to stylistic features, when reading informative texts they attend to the represented situation, and when reading persuasive texts they attend to argument structures of the texts (Spooren, 2005; Zwaan, 1994). Film genre classification also generates specific emotional moods in the viewer (Smith, 2003; Tan, 2004; Oliver, 2005; Zillmann, 1988): one and the same scene, for instance a chase, may elicit laughter, admiration or sadness, when categorized as comedy, action or drama, respectively. And, as said, genre classification influences narrative and emotional expectations of the viewers (Grodal, 1997): viewers will expect an action chase to be impressive and exciting, have a long length, and involve spectacular elaborations.

Although it may be concluded that genre classification is important for the viewer, there is little research on how the viewer is cued to classify a film in a specific genre. As outlined above, the events will play a major role in the viewer's decision on genre classification. A chase or a shoot-out might be typical for an action film, in the same sense that a happy reunion or a dead child might cue the viewer to a classification in the drama genre. Such events might even be so typical for a specific genre that people refer to these genres when the events appear in daily life.

The complements to event cues in genre recognition are filmic realisation cues. These are the cues that are specific for a genre realisation of an event; for instance, the cues that make the difference between a comic and an action chase, such as lighting, sound, acting, speech, props, setting, editing, shooting or blood. From the perspective of the viewer, the filmic realisation can be defined as "the tangible texture of the film, the perceptual surface we encounter as we watch and listen, and that surface is our point of departure in moving to plot, theme, feeling - everything else that matters to us." (Bordwell, 2005, p. 32).

That surface cues do have cue validity for genre classification is suggested by computer experiments with genre recognition software: computers can to some extent successfully recognize television genres, e.g. news and commercials, by using filmic realisation parameters such as cutting rate and presence of graphics (Agnihotri & Dimitrova, 1999; Taskiran, Pollak, Bouman & Delp, 2003). Scarce psychological experiments also show that people use surface characteristics to differentiate between genres in different cultural forms. Hayward (1994) showed that readers successfully discriminated between fictional and historical texts using differences in perceived 'tone' of the text; Dalla Bella and Peretz (2005) showed that listeners successfully differentiated between musical styles and placed them in the correct historical order. Also, average viewers can accurately classify paintings as to their originality (Locher, 2003) and commodity objects as to their emotive expression (Rompay, Hekkert, Saakes & Russo, 2005). These experiments show that viewers do not need to possess explicit knowledge of the cues and expert knowledge of the category in order to use the cues successfully in a classification task. Returning to my subject, film viewers do not need to be film experts and have an explicit knowledge of film cues, in order to differentiate successfully between genres.

Summarizing, two main cue families, the event cues and the filmic realisation cues, are expected to be of primary importance for genre recognition. Traditionally, the event cue was considered to be the most important cue for genre recognition; events are classified as, and compared to myths that in turn form the basis for genre differentiation from Aristotle to Frye. However, it can be argued that at least some filmic events do not discriminate strongly between genres. As was shown in the example analysis in Chapter 1, chases abound in various genres, and the same goes for other general events including meetings, separations, and the like. On the other hand, as the example analysis also showed, filmic realisations may add a lot to a genre's unique properties. In addition, as we shall see, recent developments in psychological theorizing about knowledge representation and categorisation have accumulated evidence for the cue validity of *surface characteristics* of events in event recognition. In our case, this implies the cue value of film surface characteristics, or filmic realisations, in genre recognition. As will described in the next section below, *simulation theory* in particular grounds knowledge in

perception and thus increases the validity of surface cues in our understanding of the world or genre classification.

H2: Filmic realisation cues, including actor movements, are at least as strong a cue as event cues in genre classification.

2.2.5 Perceptual Simulation Theory

If viewers are cued by event and filmic realisation cues, the question remains how exactly they arrive at a specific genre classification. In order to know how viewers decide if their perceptions belong to one conceptual category or another, or in more general terms, how people relate their perception to their knowledge, a short introduction will be given to the theory of mental representation, and especially the simulation theory of Lawrence Barsalou.

In general, this view advocates that people's knowledge is more strongly related to bodily experiences than was previously thought. Gibson (1979) and Lakoff (1987) were one of the first psychologists to advocate the role of bodily experiences in cognition, but the rise of neuroscience and its imaging studies by the end of the 1990s marked a new era in the theory of mind – see Barsalou (1999) for an overview. Human knowledge was no longer conceived as an amodal abstract network of meanings (Fodor, 1983) but as a conceptual representation system grounded in modality-specific systems, meaning that perception and conception use the same system of neural representations (Barsalou, 2003).

The theory of Barsalou and others can be defined as a simulation theory. According to this theory, the perceptions that enter our mind are first captured by neurons producing a representation. This representation is matched with neural representations, called *simulators*, stored in the association areas of the cortex (Barsalou, Simmons, Barbey & Wilson, 2003). The simulators are embodied memories from diverse, multimodal, origins and operate on the following three aspects of perceptual experience: (1) the five senses (vision, audition, feeling, smell & taste) as well as (2) proprioception (motor processing) and (3) introspection (processes resulting in (a) emotional states, (b) mental representations, and (c) cognitive

operations such as retrieval, elaboration, comparison and transformation (Barsalou, 1999, p. 585). The simulators are the viewers' knowledge that is effective in online processing to understand the incoming perceptions, and in off-line processing to construct thought representations and reconstruct memories. This simulation theory is new in that it grounds conceptual knowledge in modality-specific perception and experience. Evidence for the existence of simulators and multimodal simulation processes can be found in experiments on proprioception showing that observing an action, such as grasping an object, activates the corresponding muscle groups of the viewer (Fadia, Fogassi, Pavesi & Rizzolatti, 1995; Sebanz, Knoblich & Prinz, 2003; see Borghi (2005) for a further discussion on the role of motor information in concepts). For example, seeing a car key activates a motor representation in the brain of a precision grip to grasping and turning it. Another striking example is that when a description of the top of a building is presented in an experiment, participants are more likely to look up than in other directions (Barsalou et al, 2003). Thomas, Press and Haggard (2006) showed that people seeing another person being touched at a specific location of the body become more sensitive themselves at that location of their own body. Moreover, other experiments showed that reading about a motion involves the same neurological simulation as seeing a motion (Kaschak et al., 2005). It seems also highly plausible that emotion recognition runs along the same line of processing: it seems that recognition of perceived facial emotions involves a simulation of that same emotion in the viewer (Goldman & Sripada, 2005).

But if we are neurologically simulating our perception or ideas, how do we classify them appropriately? The main mechanism for classification is *matching* the incoming perception with the simulators. It should be noted that this view of categorising by matching a new and an old simulation has a flexible structure. If the two match approximately, the new simulation is added to the existing category, but if no matching simulation can be found a novel simulator for a novel category will be created (Barsalou, 1999). Conceptual categorisation is thus based on perceptual memory and people's background knowledge about the world – a constraint in the service of conceptual coherence already advocated by Murphy and Medin (1985). The knowledge that determines categorisation is

represented in roughly the same manner as the perceived entities that must be categorized (Barsalou, 1999).

Categorisation of perception is, however, not an end in itself, but provides access to categorical inferences. Because the simulators contain a "tremendous amount of multimodal knowledge about a category" (Barsalou, 1999; p. 587), the inferences will not only involve visual attributes, such as the rear view of a frontally perceived car, but also attributions of animacy, intentions and emotions. Simulation theory can thus perfectly account for the described movement attributions, intentions and event schemata. Even the mentioned sprites or movement templates can be explained by simulation theory: simulations of a familiar movement will be matched and categorized faster than an unfamiliar one.

2.2.6 Simulation Theory and a Process Model of Genre Categorisation

The simulation theory has a major impact on process of film genre categorisation. The first hypothesis of this dissertation, stating that perceived movement acts as a cue in film genre recognition, can be supported by simulation theory because the simulators people use are essentially perceptually grounded. It can be expected that the viewer's knowledge of specific genres categories includes specific visual simulators such as movements. Moreover, because the simulators contain perceptual memories, such as visual characteristics, it can be supposed that the effect of these simulators for genre recognition purposes will be more direct or faster than schematic event memories. It is expected that filmic realisation cues initiate a first categorisation, preceding full identification of events, which can be modified later by event cues. In general, the simulation theory supports the view that filmic realisation cues are at least as effective in genre recognition as event cues – as stated in the second hypothesis.

Although the main advantage of the simulation theory for genre recognition is its favouring of the role of the perceptual characteristics in the viewer's categorisation, the theory also informs about the organization of the genre categories fiction and nonfiction. Recognition of a genre is started by matching the right simulators with the incoming perceptions. Each film, although fiction films to a

lesser extent than nonfiction, contains some portion of materials known from the reality of daily life. All this daily-life-reality material of a film is understood by the viewer by making use of his large available collection of daily life reality simulators, because most simulators are created during normal life. However, many of the daily life simulators will not match with incoming perceptions of fictional events. It can be assumed that viewers have a notion of how much such perceptions deviate from the daily life simulators. Small deviations might induce a nonfiction categorisation of incoming materials, while large deviations might result in categorisation as fiction. In this way, viewers will also build up specific simulators for fictional categories. When a prototypical comedy is perceived, the viewer will match perception of, for instance, exaggerated movements with his comedy simulators and categorise the film accurately. When the film does not offer prototypical and easy to categorize perceptions, the viewer will probably try to classify the film by its deviation from nonfiction (a deviation that is carefully made by fiction directors as shown in section 2.1.5).

The deviation of fiction from reality is probably reflected in the organisation of the viewer's genre knowledge. In most cases of genre recognition the viewer might directly use the right fictional simulators, but in more ambiguous cases the viewer will probably rely on his more basic knowledge of nonfiction deviation. My research does not allow to demonstrate the activity of perceptual simulators and the matching of these with incoming perceptual inputs in any direct fashion; that would require a neuroscience setting going beyond what was feasible to the present dissertation project. However, in two out of the three experiments that I carried out, it was possible to test a derivative of the simulation and match theory of genre recognition.

I assume that deviations from reality constitute the first criterion for categorising a given fragment of film as nonfiction or fiction, and that in the second instance, film fragments are categorised as more specific instances of fiction. If this is correct, it is only a small step to propose that regular film viewers have knowledge of genres comparable to expert genre theory, about the relations between genres. In particular, I propose that they grasp the transformations from one form to another, that is they can: a) recognise nonfiction as a set of transformations from reality to a particular nonfiction genre (e.g. documentary or news), and b) fictional genres, such as comedy and

drama, as transformations from nonfiction. Transformations apply to events and filmic realisation. Genre-specific movements as part of filmic realisation, then, are recognised as resulting from genre-specific transformations. My third hypothesis is that:

H3: Fiction movements are perceived as transformations of nonfiction movements.

Transformations may also be recognised as aiming at a certain effects in the viewer. If the genre knowledge of regular viewers is essentially congruent with expert genre theory, it may be expected that regular viewers are aware of an intended emotional effect of particular genres such as comedy, drama and action. This is a background assumption that is tested in Experiment 3.

CHAPTER 3: THE EXPERIMENTS

3.1 Choosing Experimental Movement Parameters

As the present research aims at eliciting different genre classifications by varying displayed actor movements, a choice had to be made about which movements to vary. This choice is limited by purely experimental constraints: (a) the number of the parameters is severely limited due to the time-consuming nature of animation requirements of statistical testing; (b) the parameters should have minimal overlap among themselves, (c) usage and genre effect of the parameters should be independent of the event (i.e. a fast chase should be as comical as a fast happy reunion), (d) the parameters should be exactly delimited in nature and have a direct effect on the appearance of the movement. The latter would facilitate further experiments in which the parameters could be software programmed; (e) the parameters should affect locomotion instead of motion of body parts relative to one another, in order to be applied to a variety of objects ranging from a human body to abstract objects. An example of locomotion is an entire body or object following a zigzag trajectory. Restricting movement parameters to locomotion combines the advantage of increasing the generality of research with the disadvantage of excluding specific body movements, such as trunk rotation and walking.

For the choice of the parameters, little could be gleaned from the available theory. Although the choice was in a general sense inspired by some specific literature on film (e.g. Bordwell, 2005; Gianetti, 1999), genre (e.g. Frye, 1957; Neale, 2000), film acting (e.g. Baron, Carson, & Tomasulo, 2004; Kessler, 1998; Naremore, 1988; Wojcik, 2004), stage acting (e.g. Konijn, 2000; Potter, 2002;; Shawn, 1974; White & Battye, 1985), robotics (e.g. Allbeck & Badler 2003; Ashida, Allbeck, Sun, & Badler, 2001; Hille 2001) and psychological aesthetics and emotion expression (e.g. Eibl-Eibesfeldt, 1989; Kreitler

& Kreitler, 1972; Meijer, 1989; Pollick et al, 2001; Scherer & Ellgring, 2006; Tagiuri, 1960; Thinès, Costall & Butterworth, 1991), animation theory (e.g. Thomas & Johnston, 1981; Wells, 1998; Williams, 2001) proved to be the most valuable for specific choices. However, in the end, the final selection of the parameters depended on trial and error animation and on informal observation of generic differences between actor movements – such as described in section 1.1. The hypothetical effects of the final set of parameters, and its completeness as a set, was discussed at the Netherlands Institute for Animation Film, NIAf, with professional international animators Michael Dudok de Wit, Paul Driessen or Pixar animator Kyle Balda – as well as with many others.

The final set of movement parameters reads as follows: *velocity, efficiency, fluency, detail and proportion*. A complete account of how these parameters were defined in the experiment can be found in Appendix A and in Chapter 4. General theoretical considerations for the choice of the five parameters will be given below.

3.1.1 Velocity

Time and place are the fundamental components of all movements. The ratio between these two components defines the first and most basic movement parameter: *velocity*. Velocity is the most basic movement parameter and a parent to all other movement parameters; as we will see, all other movement parameters will involve higher order variations of velocity. Due to this parental status of velocity, velocity can be expected to have main effects on genre and emotion impressions. Moreover, if velocity variation would not have an effect, then no other movement parameters could be expected to have an effect either.

Research into effects of velocity mainly deals with emotion impressions rather than with genre recognition. However, as outlined in section 2.1.4 it is more than probable that emotions do have a substantial influence on genre categorisation – films that make one laugh are easily categorized as comedies. That velocity as a movement parameter has a distinctive expressive effect is clear from many emotional recognition experiments: the viewing of fast body movement leads to viewer impressions like anger, violence, joy, surprise and excitement; while slow movements leads to emotions

like grief, sadness, weakness, gentleness and sympathy (Hille, 2001; de Meijer, 1989; Michotte, 1963; Pollick et at, 2001; Scherer & Ellgring, 2006 unpublished). These expressive effects of velocity are not limited to one specific medium, but have the same kind of emotional effect in music (Juslin, 2000; Kreitler & Kreitler, 1972) and it was prescribed to dances by the 19th century dance theoretician François Delsarte: stating that profound and serious emotions require slow movements, while petty and light emotions require fast movements (Shawn, 1974). Early film psychology literature already stressed the dependence of the expressive quality of a gesture on its projected speed (Arnheim, 1934). This claim is supported in practice by the intuitive use of velocity variation by filmmakers throughout the 20th century. Fast-motion, produced by projecting events at a faster frame rate than they are shot at, is used as a technique by filmmakers to heighten the comic effect of a scene, whereas slow-motion techniques are used to make a scene look more tragic (Gianetti, 1999). The latter finding leads to the hypothesis that velocity will be mainly effective in the recognition of drama (slow) and comedy (fast).

3.1.2 Efficiency

I propose that the efficiency of a movement is defined by three components: (a) the attributed goal of the characters, (b) the means by which the character wants to achieve his goal, and (c) the result of the character's action as expected by the viewer. The ratio between the energy a character uses to achieve his goals and the energy that is minimally needed to achieve that goal, determines the degree to which an action is perceived as efficient. Normally viewers are able to judge the efficiency of an action before the result of the character's action is known: they anticipate the result of a character's action by the judged efficiency of the action. Comic films typically exploit anticipation in 'surprise gags' by having viewers expect one thing to happen, and then showing another thing to happen. Highly efficient actions are used in the action genre to impress the viewer (Neale, 2000). Efficiency can be compared with the animation principle of 'anticipation' (Thomas & Johnston, 1981; Williams, 2001): anticipatory movements prepare the viewer for the actions and intended goals of the characters – for example, a character should first

look at an object before grasping it. Highly efficient actions abound in action movies, where they function to impress the audience (Neale, 2000).

3.1.3 Fluency

The perceived fluency of a movement depends on the smoothness of velocity transitions at points of velocity change. For instance, when a character involved in a chase negotiates a bend, he decelerates his original velocity x, until arriving at a lower velocity y at the extreme position of the bend, and then accelerating again to velocity z when he has gone around the bend. The transition between the three velocities can be smooth or abrupt. Very smooth movements, not only of characters but also of other cinematic devices like edit transitions, camera positions and colours, are expected to be associated with drama. Abrupt movements are associated with the comic genre (cf. the stop and go chases of Laurel and Hardy or the Chuck Jones' Roadrunner animations) but also with the action genre (where action heroes in a fight appear to move as abruptly as firing guns). In human body movements, fluency can be compared with the energy or power of the movements. Wallbott (1998) showed that the energetic movements express the action genre emotions of anger and fear and at the same time the comic emotion joy. Non-energetic body movements express sadness or boredom, but also happiness typical for drama. Fluency is arrived at by filling gaps between any two subsequent actions, termed "overlapping action" by animators (Thomas & Johnston, 1981). Finally, it is important to note that fluency is defined here as a parameter of the temporal domain. That is, it does not involve spatial continuity of movement, like in "fluent lines".

3.1.4 Detail

Degree of detail of movements is also a temporal parameter in the research reported in this dissertation. Most natural movements are not carried out with one steady velocity but with a series of different velocities succeeding each other. The number of velocity changes per unit of time determines the detail of the movement. A

movement with maximal detail appears as pure chaotic movement, while a movement with very little detail looks like purely mechanical movement. In general, it can be stated that naturally occurring movement is more chaotic than that in most invented fictional products that are often explicitly geared towards specific communicative goals – like making people sad. Nonfiction film, in contrast, attempts to remain close to reality and often gives an impression of an immediate recording of reality. As a consequence, nonfiction movements, like natural movements, tend to be far more chaotic and undirected than fictional movements. This shows itself in the amount of detailed movement: I compared happy reunion scenes from diverse fiction films with happy reunions taking place in the reality of the arrival gate at Amsterdam Airport. The movements people made at the airport involved much smaller and seemingly subconscious movements, like changes of balance or head movements, than the structured clear-cut movements of fiction films. Ashida et al. (2001) come to a similar conclusion when they wanted to create artificial agents behaving naturally: they had to implement chaotic small movements in their character that were perceived as subconscious movement reflecting naturalness. Detail will have most effect on differentiating nonfiction from fiction genres.

3.1.5 Deformation

Deformation refers to dynamic shape alterations of a non-rigid object when it changes its course. Non-rigid objects include biological bodies but not hard objects like stones. The amount of deformation is dependent on 1) the form of the object in relation to its course, and 2) its flexibility. When a tall and slim persons runs around a bend he will deform little, but when a short and fat person runs around a bend, he will deform in that one arm will turn around the bend notably later than the other. In comic films, the deformation of the character negotiating a bend is often enhanced by extending the horizontal proportion of the comic character's body: like walking with feet apart, dragging objects or other characters, having arms spread - see the Chaplin example in Figure 5, Chapter 1. Such high degrees of deformation create an impression of uncontrolled movement and elasticity of the characters body. Elasticity is a trademark of comic

actors ranging from Buster Keaton to Jim Carrey. In action films deformation is often minimal to give the viewer an impression of controlled movement and the rigid, powerful and stiff body of the actor – comparable to ice-skaters negotiating a bend. To minimize deformation, the action character often runs as non-horizontal as possible by holding their arms to their sides, placing their feet in front of each other and holding their trunk erect. In animation theory, deformation is described as the "squash and stretch" (Thomas & Johnston, 1981) technique.

Figure 7. Arnold Schwarzenegger performing in the comic film *Jingle All the Way* (1996) and in the action film *Total Recall* (1990).

3.2 Summary of Hypotheses

In the introduction, Chapter 1, section 1.2, the following two research questions were proposed:

RQ 1. Does the filmic realisation of an event influence the viewers' genre classification, and do specific actor movement patterns act as genre cues?

RQ 2. Do viewers possess implicit genre knowledge and, if so, how is this organized?

To answer these questions, I proposed three main hypotheses in Chapter 2. The first hypothesis concerns the effect of movement cues on genre recognition, the second concerns the difference between filmic realisations and events, and the third concerns the relation between fiction and nonfiction in terms of movement transformation:

H1: Movement acts as a cue for film genre recognition.

H2: Filmic realisation cues, including actor movements, are at least as strong a cue as event cues in genre classification.

H3: Fiction movements are perceived as transformations of nonfiction movements.

The first test for H1 is performed in Experiment 2, by varying the velocity of existing film scenes. H1 is tested in an explorative manner in Experiment 3, using computer animations varied on the above-described five movement parameters. This latter experiment also has two explorative aims: (1) to investigate the relation between genre impressions and emotion/aesthetic impressions, and (2) to investigate which levels of the five movement parameters are the strongest cues for each genre and emotion/aesthetic impression. H2 is tested in Experiment 1 using existing film scenes and varying event and filmic realisations independently. H3 is tested in all three experiments: in Experiment 1 and 2 by using existing film fragments, and in Experiment 3 by using animated movement transformations.

3.3 Overview of the Experiments

This section presents an outline of the three conducted experiments. The results of the experiments will be presented in detail in the separate chapters and in the General Discussion, Chapter 7. Two additional experiments are currently being carried out; they will be briefly discussed in the General Discussion.

Experiment 1: The effect of genre typical events vs. genre typical filmic realisations on genre recognition

This study is described in detail in Chapter 4 and deals with two issues in the recognition of genre. First, it addresses the second main hypothesis H2: whether film viewers recognize genres on the basis of genre-typical events or on the film's style, that is, genre-typical filmic realisations of events. A second question addressed by the study relates to the third hypothesis H3: how genre knowledge possessed by that regular film viewers, is organised. It is assumed that a basic distinction between nonfiction categories on the one hand, and fictional categories on the other, underlies the knowledge representation of genre. It is proposed that fictional events and filmic representation are more typical for their genres than are nonfiction events and filmic representations.

As stimulus material for this experiment four genre typical events were chosen: *tripping over* for the comic genre, *happy reunion* for drama, *running chase* for action and *waiting for an elevator* for comedy. For each of these four events, eight filmic realisation samples were gathered from film and television material: two comic, two drama, two action, and two nonfiction filmic realisations. The filmic realisations were derived from a pilot study using a larger set of samples. The image quality of all stimulus scenes was visually impoverished to prevent film and actor recognition, and sound was omitted. Subjects were asked to judge the genre fittingness of each scene in the comic genre, the drama genre, the action genre and the nonfiction genre. This experiment has the following predictions:

> a. Filmic realisation cues, including movement, are at least as strong a cue as event cues in genre classification.

b. Fictional events and filmic realisations have a stronger (positive) influence on the recognition of comedy, action and drama genres than nonfictional events have on the recognition of the nonfiction genre.

c. Nonfiction events and filmic realisations are judged to fit better in a fiction genre, than are fiction events to fit in the nonfiction genre.

Experiment 2: The effect of film velocity on genre recognition

After an analytic comparison of different aspects of genre specific realisations, it was proposed that velocity was one of the main differential parameters. This experiment, presented in Chapter 5, was set up to test whether different velocities of the same event would in fact affect the viewer's genre classification. When it could be demonstrated that velocities do affect the viewer's genre classification, more detailed experiments on other movement parameters could follow, testing main hypothesis 1 (H1). For this experiment it was hypothesized that accelerated scenes positively affect viewer judged fittingness in the comic genre and negatively in the drama genre; deceleration would have the opposite effect.

For this experiment a collection was made of scenes depicting a *happy reunion* event. They stemmed from four genres: comic, drama, action and nonfiction. The scenes were captured from feature films and television items. All stimulus materials were visually manipulated in the same way as in Experiment 1 and sound was omitted. All scenes were presented in three velocities: accelerated by one third, decelerated by one third, and at its original velocity. Subjects were asked to judge the genre fittingness of each scene in the comic genre, the drama genre, the action genre, and the nonfiction genre. The predictions for the second experiment were as follows:

a. Velocity serves as a cue for genre recognition.

b. Velocity variation will be most effective as a genre recognition cue for the dramatic and the comic genre.

c. Velocity has effects on recognition of the dramatic genre reverse to that of the comic genre.

Experiment 3: Categorisation of Film as Fiction Involves Perceiving Deviations from Nonfiction

This experiment compares the effect of five movement parameters, as putative part of filmic realisation, on the viewer's genre recognition. Both main hypothesis 1 (H1) and 3 (H3) will be tested in more detail than in the previous experiments. For this experiment, I made computer-generated 3D animations of a running chase in Maya. The chaser and the chased were depicted as abstract blocks. One neutral animated chase was created and 20 variations of it, in which the movements of the chaser were varied resulting in four levels for each of the following parameters: *velocity*, *efficiency*, *fluency*, *detail* and *deformation*. Participants were asked in this experiment to judge each scene as to genre fittingness (in the comic, drama, action and nonfiction genre), to genre-related emotive impression (funny, sad, impressive and scary) and to aesthetic quality (surprising, beautiful, fascinating). Predictions for this experiment are as follows:

> a. Realism prediction: stating that untransformed neutral movements will be classified as fitting best in the nonfiction genre, and to have a declining fittingness score from nonfiction to drama to action to comic.
> b. Transformation prediction: stating that moderate transformations from nonfiction scenes are associated with fittingness in the genres drama and action, while strong transformations are associated with fittingness in comedy.

Data from this experiment allow to establish which movements optimally elicit each of the mentioned viewer impressions. They also enable to identify underlying factors that group genres according to the emotive and aesthetic impressions that they typically give rise to. Moreover, the experiment provides insight into the relations between the genres in terms of movement transformations. This third experiment is described in Chapter 6.

CHAPTER 4: EFFECT OF GENRE TYPICAL EVENTS VERSUS GENRE TYPICAL FILMIC REALIZATIONS ON FILM VIEWERS' GENRE RECOGNITION

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4.1 Abstract

This study investigated whether film viewers recognize four basic genres (comic, drama, action and nonfiction) on the basis of genre-typical events or of genre-typical filmic realizations of events. The results showed that: (a) filmic realization was the stronger cue in viewer's genre recognition, except for drama recognition; (b) the influence of a genre-typical event on genre recognition decreased stepwise from drama to action to comic to nonfiction; (c) nonfiction realizations were more readily recognized as fiction than were fiction realizations as nonfiction; nonfiction exports its filmic realization to fiction; and (d) the drama genre imports filmic realizations and events from other genres. The results are consistent with a conception of memory for film that acknowledges the role of media-specific mental representations.

4.2 Introduction

The ability of viewers to recognize audiovisual genres is obvious when they zap through television channels. They seem to know within seconds whether they have selected a comedy or a nonfiction production. Their ability to differentiate between genres is of great importance. Genre impressions may have their use for viewers in priming attention (Roskos-Ewoldsen & Dillman-Carpentier, 2002), in shaping perception and viewing style (Hawkins et al, 2005),

in generating narrative expectations (Grodal, 1997) and in the development of viewing emotions (e.g. Tan, 1996; Smith, 2003). An event like some character bumping into another person may be perceived as accidental and funny in a comedy, but as telling of the characters' preoccupations with serious matters in a psychological drama. Genre recognition's role in mood management is illustrated by the observation that given a mood state (e.g. tender, happy, sad, and tense), people can tell what film genre they would like to view (Oliver, 2005).

That viewers seem to recognize genres raises the question how this is achieved. What knowledge is used, and how is this knowledge organized? The present study explores some factors at work behind genre recognition, focusing on film genre. Numerous studies can be found in the humanities on film genres that describe genre distinctions and similarities, the historical development of genres or the commercial and institutional significance of genres (e.g. Altman, 1999; Schatz, 1981; Neale, 2000). However, there is scarcely any empirical knowledge on the issue of how viewers arrive at a specific genre impression. Obviously in most situations movie viewers know in advance to which genre the film belongs that they are going to watch – most films come *indexed* (Carroll, 2003). But in some situations like in channel zapping, the film does not. In order to determine genre, viewers have to rely on cues provided by the current film sequence. It seems likely that even when watching indexed films, viewers use film cues to check and possibly refine their categorizations. This is first, because indexes are not always reliable; it happens that what is a labelled a 'psychological thriller' turns out to be a horror movie. Second and more importantly, categorizing is not an end in itself, as we just saw, but it helps viewers to get out of a film what is in it for them, and that is why they detect genre cues and refine genre categorizations all the time.

What cues are effective in genre recognition is far from clear. Studies from the humanities have proposed widely varying attributes such as plot and setting, iconography and film style (Bordwell & Thompson, 2004; Altman, 1999). Our study aims at assessing the validity of two major cues that are immediately, that is, perceptually available to every film viewer, one being the events and the other the filmic realizations.

Events consist of the narrative happenings in a scene, while filmic realizations consist of the cinematic representation of a scene. A fundamental difference between an event and its filmic realization is that events are perceived as time units, marked by a beginning and an end (Zacks & Tversky, 2001), while filmic realizations can be conceived more continuously. Newtson (1973; Newtson & Enquist, 1976) showed that people can easily demarcate events in a film displaying ongoing character behavior. In addition, Baird and Baldwin (2001) showed that viewers base their points of demarcation on their interpretation of the presented intentional actions of the characters. When an event has been demarcated, it is fitted in story schemas (e.g. Mandler, 1984). These schemas activate genre specific mental models, which in turn enable viewers to make inferences about the content, order and outcomes of events to come (Zacks & Tversky, 2001).

The filmic realization is what a film looks and sounds like. It makes events perceivable and lends specific sensory qualities to them. Filmic realization is an expert term, referring to analytic categories such as character movement, camera movement, actor behavior, editing, lighting, setting, props, and so on. Dealing with these categories presupposes some knowledge of how films are made. There is a lack of research evidence on whether regular film viewers distinguish these categories in viewing images and hearing sound. However, experiments on painting and object perception suggest that regular viewers do not need to distinguish between such analytical categories in order to successfully classify the objects with regard to their originality (Locher, 2003) or emotive expression (van Rompay, Hekkert, Saakes & Russo, 2005). From the perspective of the film viewer, the filmic realization can be defined as "the tangible texture of the film, the perceptual surface we encounter as we watch and listen, and that surface is our point of departure in moving to plot, theme, feeling - everything else that matters to us." (Bordwell, 2005, p. 32)

How useful are events and filmic realization for categorizing genre? In order to function as category cues, they must be perceived as such and remembered. That people perceive events and actions and have a memory for them, like they have for persons and places seems to be uncontested. The idea that events can be a basis for telling genres apart is easy to accept; some events seem to be typical for genres. A

final shoot-out is typical for a Western, a character sliding over a banana peel must be part of a comedy and the rejection of a lost son returning home by his merciless father is a typical example of a drama. Most regular viewers will recognize such events as typical and many of them may be able to mention one or more typical events for the major film genres. Whereas most people cannot memorize the details of any film in the longer run, they can fall back onto typical and schematized events, as the research in memory for stories has abundantly shown since Bartlett's studies (Bartlett, 1932). In contrast, whether filmic realizations are perceived as such, and whether they are retained in memory and are used to recognize genres is much less obvious. Remembering formal features requires attending to surface structure details, or data-driven processing, and people are not used to do this when following a story or watching a movie – although Baggett (1979) showed that the surface characteristics of movies are better retained than those of verbal stories. Nonetheless, there is some evidence of the use of stylistic surface features in recognizing genres. Genre recognition studies in literature (Hayward, 1994) and music (Dalla Bella & Peretz, 2005) showed that genres can accurately be recognized by their stylistic differences. Visch & Tan (in press) showed that manipulation of a filmic realization cue, i.e. the velocity of a sequence, affected the genre recognition of a scene significantly. Another indication that surface features have cue validity is formal rather than psychological in nature. There are computer programs that detect genre, using shallow features such as words or even character combinations like trigrams, and comparable software has been developed that recognizes television genres, e.g. news and commercials, by filmic realization parameters such as cutting rate and presence of graphics (Agnihotri & Dimitrova, 1999; Taskiran et al., 2003).

The idea that only a so-called amodal, propositional description of perceptual images is retained in long-term memory, while the surface features of images are not stored in memory at all (e.g. Pylyshyn, 1973), has been influential for years (cf. Anderson, 1983, p. 46). Most recent memory research has essentially reversed the perspective on the role of deep meaning versus surface structure in memory. Researchers now realize that cognition is not a system of abstract processes running in a void, but that cognition is embodied (Lakoff, 1987; Barsalou, 1999; Borghi, 2004; Pecher & Zwaan, 2005;

Thomas, Press & Haggard, 2006). According to one particularly influential view, memory consists of a set of perceptual simulators that retain perceptual information in a format closely resembling actual perceptual processes and attributes (Barsalou, 1999). The attributes involved directly reflect the surface characteristics of original stimuli. People can run perceptual simulations from memory in the absence of visual stimuli (Barsalou, Simmons, Barbey & Wilson, 2003). In line with this view, regular film viewers do not only have event schemas but also perceptual simulators available that can act as references in identifying relevant cues and categorizing new instances. The perceptual simulators reflect the surface characteristics, that is, the specific filmic realizations of films that have been viewed.

Event schemas being immediately derived from perceptual simulators, rather than resulting from the operation of rules or any other abstract mechanism (Barsalou et al., 2003), are secondary to perceptual cues. Therefore, filmic realization may be even a stronger cue in genre recognition than events. Another reason for a superiority of filmic realization cues is that events often feature in more than one genre. Even if some events may be highly typical for a genre, they can still occur in other genres. For instance, a shoot-out also takes place in mob movies, when two gangs engage in a decisive battle, car chases can be found in action movies like The Matrix Reloaded (Wachowski & Wachowski, 2003) and in comedies such as Me, Myself and Irene (Farrelly & Farrelly, 2000). An additional reason for positing the superiority of filmic realization cues is that viewers may recognize genres before they have identified any event, as in zapping, or in watching music video clips that lack recognizable events.

H1: Filmic realization has a stronger effect on genre recognition than portrayed events.

In the present study we attempted to obtain the effect of filmic realizations versus events on the viewer's genre recognition by letting the viewer judge the genre fittingness of film sequences with different event-realization combinations. Four events were selected that can be considered prototypical for respectively the comic, action, drama and nonfiction genre. For each of these events we collected different filmic realizations from prototypical genre films of the four

genres. Participants had to judge the fittingness of each sequence in each of the four genres.

The set-up of the study allowed for testing another theoretical assumption underlying genre recognition, about the way genre knowledge is organized. We assume that all fictional genres are basically transformations of nonfiction. The distinction between nonfiction and fiction, and their transformational relation, can already be found in Aristotle's Poetics (1988) where he discusses the relation between fictional tragedy and nonfictional historiography. In comparing the two genres, he distinguishes between the treatment of plot, or the represented events, on the one hand, and rhetorical style, comparable to our filmic realization, on the other. According to Aristotle, historical events described in historiography do not have to be represented in a coherent structure, because they happened in a non-coherent way in reality as well. In contrast, the poet writing a tragedy should structure and transform these events into a causally coherent unity. Concerning rhetorical style of tragedy, Aristotle stresses the fictional transformation of nonfiction rhetoric: fictional rhetoric is not used to present events neutrally, but to manipulate, positively or negatively, the importance of an event.

Present day theories of fiction stress referential differences between fiction and nonfiction in a similar vein. Nonfiction is characterized by its assertion to maintain a direct reference to reality (Plantinga, 1997) while fiction is characterized by a more complex (Goodman, 1984) or "partially determined" (Branigan, 1992) reference to reality. The transformation of daily life is seen as the main purpose of art by the Russian Formalists. Such a transformation would lead to a viewer estrangement that causes him to see reality from a new perspective (Shklovsky, 1991/ 1929). With regard to mainstream film, the transformations consist of specializations of nonfictional events and realizations with an eye at certain entertainment effects on viewers. In our case, comedy, action and drama can be considered as specializations of nonfiction or reality episodes geared towards provoking mirth, sensation and sympathy, respectively. Both events and filmic realization of fiction films may have become selected in the history of entertainment film to this end. The idea is quite known in theories of literary and dramatic genres. For instance, it has been observed that all fiction involves not a high-fidelity reproduction of reality, as nonfiction does, but the extraction of idealized essentials

(Bordwell, 2005). What is left out from and added to a more true to life picture of reality should render the narrative more gripping (Martin, 1986), that is provide an anchor for the viewer's interest (Tan, 1996). In addition, the extra non-real qualities will differ for each of the fictional genres, in line with the emotions that are part of their characteristic effects (Tan, 1996; Grodal, 1997). For instance, in horror films events deviate from normal in a horrific way, whereas those in a film comedy tend to transgress cultural norms (King, 2002; Altman 1999), ridiculing the transgressor or the norms.

From a psychological point of view, the distinction between reality and fiction is no less important, and it is only natural to assume that it is consequential for the representation of film knowledge as well. People elaborate on reality by envisioning what could happen all the time and there is probably a great adaptive advantage in the capability to do so. Counterfactual ideas, imaginations and fantasies may be stored in memory alongside real events. Memories of really experienced events are dominant because they have a higher degree of embodiment, that is, they abound in perceptual features that match with immediate perception of like events, whereas memories of imagined and fantasized events – and imagination and fantasy themselves - do so only to a lesser degree. When thinking or communicating about events, people can tell whether they are real or imaginary. This difference in mental representation is also used when understanding another person's communication about events. Nonfiction films are recognised as slices of life because they look perceptually similar to real life memories and experiences. Fiction films, on the other hand, look less real because what they show has often not been fully experienced in reality.

In our view, recognizing a film sequence as fiction involves, first, spotting a general deviation from a corresponding 'slice of life', making it an instance of nonfiction, and second, recognizing the precise transformation involved, making it an instance of a particular fiction genre. For instance, perceiving extreme difficulties a character has in performing an everyday routine like dressing is a cue to fiction, and, subsequently perceiving the actor's virtuoso performance stressing the character's lack of control is a cue to recognizing comedy. The transformation involved, a skilful exaggeration of the minor hassles we know from daily life to absurd proportions, is appraised as comic, it makes the viewer laugh, and incites interest. Fiction genres

are seen as specialized transformations of nonfiction, whereas nonfiction acts merely as a neutral base for comparison. Instances of nonfiction may vary greatly from each other, whereas instances of one fiction genre share roughly the same transformations. If this is so, then any particular fiction example should be more readily recognized as a member of its genre than any nonfiction example. We therefore predict that:

H2a: Fictional events have a stronger (positive) influence on the recognition of comedy, action and drama genres than nonfictional events have on the recognition of the nonfiction genre.

H2b: Fictional filmic realizations have a stronger (positive) influence on the recognition of comedy, action and drama genres than nonfictional filmic realizations have on the recognition of nonfiction genre.

If there is truth in the assumption that all fiction is a specialized transformation of the neutral nonfiction, then nonfiction events may appear in fiction scenes, because of their generality, whereas the opposite would not be expected; typical fictional events are too specialized to fit in nonfiction. For instance, someone opening a door will appear in fiction as well as in nonfiction, but fiction scenes, like flying on a bike through the air, only appear in fiction. Non-specialized nonfiction scenes can be exported to fiction genres, whereas the way back is more difficult to go: nonfiction can import fictional events and realizations only under very special circumstances – such as re-enacted crimes in police reality shows. It might thus be expected that nonfiction exports more than it imports because of the generality of nonfiction. A second argument for the exportability of nonfiction to fiction concerns the difference in importance between fiction and nonfiction for the viewer. When a viewer categorizes a film as nonfiction, the film might have more direct consequences for the viewer's daily life than fiction films have. It can therefore be expected that viewers are more alert in checking the nonfiction status of fragment categorized as nonfiction than in checking the fiction status of a fragment categorized as fiction; one fictional insertion in a nonfiction film might lead viewers to change their categorization from nonfiction to fiction. In contrast, one nonfiction insertion in a fiction

film will be seen as an exception that does not prompt a categorization shift. Visch & Tan (in press) have found some evidence for the one-directional exportability of nonfiction materials into fiction. In that study nonfiction scenes were found to be judged as fitting better in fiction genres than fiction scenes fitted in the nonfiction genre. In the present study event-related fittingness is distinguished from realization-related fittingness. We hypothesize that a similar argument can be made for the genre cue validity of filmic realizations as for that of filmic events.

H3a: Nonfiction events are judged to fit better in a fiction genre, than are fiction events to fit in the nonfiction genre.

H3b: Nonfiction filmic realizations are judged to fit better in a fiction genre, than are fiction filmic realizations to fit in the nonfiction genre.

4.3 Method

Only original film materials were used, limited to the comic, action, drama and nonfiction genres. It should be noted that this classification is global and inaccurate in view of expert knowledge of genres. In particular, it confuses Aristotelian tragedy with 'drama' (for a clarification of the latter two terms see (Zillmann, 1998). We adhered to this misunderstanding because it may be expected that non-expert informants could deal better with this classification because it is common in film publicity, such as program guides, movie databases, videoshops and so on. Inclusion of the nonfiction genre is based on the assumption hypothesis that all fiction is a transformation of nonfiction.

As we wanted to assess effects of genre typical filmic realization independently from effects of genre typical event, and because a filmic realization and events do not exist separately from each other, we had to select combinations of an event and a filmic realization presented as one stimulus. Through selection, the factors filmic realization and event were each varied at four levels representing a genre: comic, drama, action and nonfiction.

Prototypical Events and Filmic Realizations

Requirements for the four used events were that they should: (a) be prototypical for only one of the four genres, and (b) occur in the other three genres as well as a non-prototypical event. An example of an event matching the requirements would be "tripping over": prototypical for the comic genre, and occurring in other genres as well. In contrast, on the one hand "slipping over a banana peel" would be another prototype in the comic genre but an event not occurring in other genres. On the other hand, an "unexpected setback" occurs in every genre, but is too general to be prototypical for the comic genre. From a larger pool of events four items were chosen: "waiting for the elevator" as prototypical event for the nonfiction genre, "happy reunion" for drama, "running chase" for action and "tripping over" for comedy.

Filmic realizations that were considered typical for a genre were chosen using available classifications of the title from which a sequence was selected (e.g. label at package or from publicity materials or movie databases). Sequences of fiction event/ filmic realization combinations were derived from digitized video or DVD releases of various feature films ranging from Chaplin's Idle Class (1921) to Tarantino's Reservoir Dogs (1992) – all used fragments are listed in the Appendix. Nonfiction filmic realizations were obtained from news items provided by the archives of the Dutch Institute of Image and Sound in Hilversum. This archive contains the majority of television programs broadcasted on the Dutch channels since 1951. In addition, nonfiction filmic realizations of the 'waiting for the elevator' event were shot as non-staged scenes on location. All sequences were 8 to 24 seconds in length.

Pilot Study

In order to obtain the best set of prototypical sequences as to event and filmic realization, a pilot study was conducted. Both factors, filmic realization and event, have 4 levels: comic, drama, action and nonfiction. For each of the 16 filmic realization/ event combinations, 4 replications were selected from different movies. In all resulting 64 sequences sound was omitted and image quality impoverished, to the

effect that only moving contours of actors were visible - see Figure 1. This was done in order to keep genre cues constant over all sequences and avoid genre recognition by an actor's face alone.

Figure 1. Image Distortion Example.
All sequence were visually impoverished by applying the following video image filter in Adobe Premiere 5.0: convolution kernel: find edges; black and white; brightness and contrast: -4 and 9 respectively; color balance: r = 0, g = 200, b = 200 (%); clip: top = 18, bottom = 23 (%), fill color = black.

Sixteen participants judged each of the 64 sequences as to their fittingness in the comic, drama, action and nonfiction genre on a 5-point scale. In the analysis genre prototypicality of the filmic realizations and events of each of 64 sequences were computed by taking the ratio between the judged fittingness of a sequence in its original genre and the mean judged fittingness of those sequences in the three remaining genres. These prototype scores were used to select 32 out of the 64 sequences to be used in the main experiment.

Main Experiment

Materials and dependent measures

The stimulus material consisted of 32 film sequences with the sound omitted and visual appearance impoverished – see Figure 1. Sequences were selected as to the following four independent variables: (a) genre of event (4 levels), comprising: comic (tripping over), drama (happy reunion), action (running chase) and nonfiction (waiting for the elevator); (b) genre of filmic realization (4), i.e. the catalogue genre of the films from which the sequences were derived, also comprising four levels: comic, drama, action, and nonfiction; (c) replication (2), for each event/ filmic realization combination two sequences from different films were taken; and (d) order (2), one half of the participants saw the 32 sequences in one randomized order, while the other half saw them in the reverse order. The dependent variables were: (a) fittingness judgment (4), the participants had to judge on a 5-point scale the fittingness of each sequence; (b) quality (1), the participants had to judge the general quality of each fragment on a 5-point scale; (c) gender (2) of the participant.

Design of the study

The general design of the study is a full factorial within-subject design comprising the following variables: 4 (genre of recognition) x 4 (genre of event) x 4 (genre of filmic realization) x 2 (replication) x 2 (order) x 2 (gender), with the first four variables as within subjects factors and the last two as between subjects factors. The dependent within subject variables were genre fittingness judgment (4) and quality judgment (1).

Procedure and participants

Participants were tested in groups. Each sequence was presented two times separated by a short interval, after which the participant rated the sequence in the questionnaire. Seventy-three first year students of the University of Amsterdam participated in the experiment. Participation was rewarded with a cinema ticket. All informants were naïve as to the purpose of the study and randomly assigned to the conditions. Three of 73 participants were excluded from the analysis because they skipped a considerable part of the questionnaire, leaving a total of 70 participants.

4.4 Results

The experimental design used in this experiment is a full-factorial within-subject design. We analyzed its results using MANOVA as the main statistical procedures to obtain main effects. However, as our hypotheses entail fine-grained differences across and between the variables, we had to rely on paired sample T-tests for most of our results.

Effects of control variables were investigated. A MANOVA showed that judged quality of sequences interacted significantly ($p < 0.05$) with fittingness in the comical and the action genre. Gender, order and replication interacted significantly with at least one of the four fittingness judgments. In order to control for their effects, all four control factors were included as covariates in the analyses to be reported.

Correctness of Genre Recognition

The hypotheses on the differential effects of events and filmic realizations on genre recognition presuppose that selected sequences be recognized more or less correctly. Table 1 shows that recognition for all genres exhibited a satisfactory level of accuracy.

	Recognized as comic	Recognized as drama	Recognized as action	Recognized as nonfiction
Comic sequence	**88**	9	12	20
Drama sequence	4	**96**	8	23
Action sequence	14	42	**95**	5
Nonfiction sequence	5	14	4	**82**

Table 1. Accuracy of Genre Recognition.
The values represent percentages of sequences that are judged by the participant as fitting "well" or "excellent", i.e. values 4 or 5 on the used five-point scale, in a genre. The sequences referred to in this table have the same genre of event and of filmic realization. Bold numbers at the diagonal represent percentages correct genre recognition.

Genre-Prototypicality of Events and Filmic Realizations

In the analyses presented here the mean fittingness scores of the two replications for each event-realization combination were used as the dependent measure.

Events: The drama and the action event, i.e. the happy reunion and running chase, were judged to fit better in their own genre than in any of the other genres (t-tests with second to best genres: $t(69) = 22.1$, $p < 0.01$, $r = 0.94$; $t(69) = 10.65$, $p < 0.01$, $r = 0.79$ respectively).

The comic event was not judged to fit exclusively in the comical genre; there was no significant difference between its fittingness in the comic genre and its fittingness in either the drama or the action genre, although the difference between its fittingness in the comic genre and the nonfiction genre was significant ($t(69) = 4.65$, $p < 0.01$, $r = 0.49$). However, within the comical fittingness scores, the comical event fitted significantly better than any other event ($t(69) = 5.58$, $p < 0.01$, $r = 0.56$).

The prototypicality for the nonfiction event suffered from similar problems: the nonfiction event was judged to fit significantly better in the drama genre than in the nonfiction genre ($t(69) = -6.5$, $p < 0.01$, $r = 0.62$). Moreover, within the nonfiction genre, the nonfiction event failed to fit significantly better than any other event.

Filmic realizations: All filmic realizations were recognized to fit best in their original genre. T-tests proved that the recognition in the genre of origin was significantly better ($p < 0.01$) than recognition in the second to best genre.

Genre of Filmic Realization Determines Viewer's Genre Recognition

The factors filmic realization and event had a significant main effect on judged fittingness: $F (12, 6657) = 442.83$, $p < 0.01$; $F (12, 6657) = 87.80$, $p < .01$, respectively. A first indication to validation of our first hypotheses, i.e. the genre of filmic realization has a stronger effect on genre recognition than the genre of events has, is that the effect size partial η^2 of filmic realization, 0.44, is superior to that of event, 0.14.

A more fine-grained analysis is based on a selection of sequences where either the event or the filmic realization, but not both,

is at odds with the target genre that is, the genre of which the fittingness has to be judged. For each of the four genres, the effect of its event on its recognition, is proportional to the mean fittingness scores of the three filmic realizations (times two replications) featuring the same event, but differing as to the genre of filmic realization. For instance, to see how the comic event, tripping over, affects comic recognition, the comic fittingness scores are taken of all sequences that show a tripping over and have a filmic realization in the drama, action and nonfiction genre. Similarly, the mean genre fittingness scores of sequences having the same filmic realization typical for a genre, but differing as to generic event, reflect the effects of the genre typical filmic realization on the recognition of that genre. The two sets of means are presented in Figure 2.
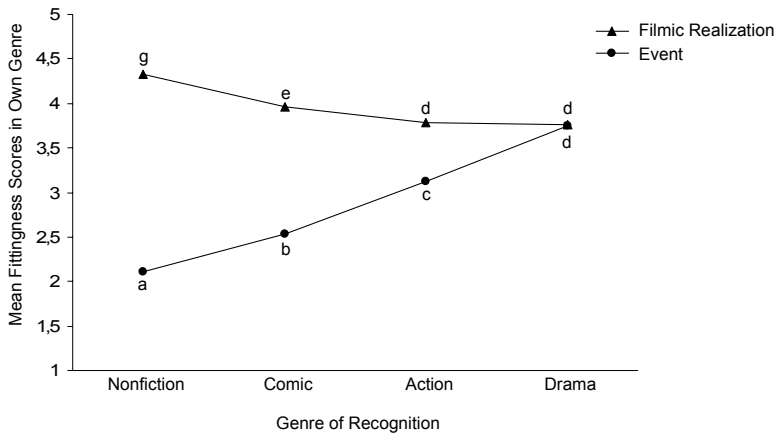
Figure 2. Influence of Genre Typical Filmic Realization and -Event on the Recognition of a Genre.
Means of GFJ in proper genre are obtained across realizations in remaining three genres (Events) and across realizations in remaining three events (Realizations). Differences among alphabetical letters indicate significant differences between the corresponding means with p < .02.

Hypothesis 1 predicts that filmic realization outperforms the event in all four genre recognitions. In terms of the design, the prediction is: for target genre i, the mean fittingness scores in genre i for the three sequences combining event$_{j,k,l}$ with filmic realization$_i$ are

superior to those for the three sequences combining event$_i$ with filmic realization$_{j,k,l}$. All superiority predictions were subjected to a one-tailed t-test. For example, if the target genre i is nonfiction and we have 1) a sequence showing an event typical for comedy – a tripping over, in a nonfiction style, and 2) a sequence showing a nonfiction event – waiting for the elevator, realized in a comic fashion, then we expect from hypothesis 1 that the first sequence leads to a higher judged fittingness for comedy than the second. Similar comparisons are made between nonfiction and drama, and nonfiction and action.

For nonfiction, the tests showed that all three genre combinations differed significantly in favor of the nonfiction filmic realization over the nonfiction event: comic - nonfiction: $t(69) = 21.66$, $p < 0.01$, $r = 0.93$, drama - nonfiction: $t(69) = 18.12$, $p < 0.01$, $r = 0.91$ and action - nonfiction: $t(69) = 19.71$, $p = < 0.01$, $r = 0.92$). For the comical genre as target, recognition likewise depended significantly more on the (comical) filmic realization than on the (comical) event of a sequence with all genre combinations: drama - comic: $t(69) = 14.41$, $p < 0.01$, $r = 0.87$; action - comic: $t(69) = 21.92$, $p < 0.01$, $r = 0.94$; nonfiction/ comic $t(69) = 1.68$, $p < 0.5$, $r = 0.20$. As to the recognition of the action genre: the action filmic realization dominated the action event in the combination with comic ($t(69) = 8.04$, $p < 0.01$, $r = 0.70$) and drama events ($t(69) = 10.08$, $p < 0.01$, $r = 0.77$). In the combination with nonfiction, however, the action recognition of a nonfiction event with an action filmic realization was almost the same as the action recognition of an action event with a nonfiction realization (means were respectively 3.69 and 3.74, with no significant difference). Concerning recognition of the drama genre, only the comic - drama combination differed significantly in favor of the dramatic realization ($t(69) = 6.89$, $p < 0.01$, $r = 0.64$). Unexpectedly, the drama event significantly dominated the drama filmic realization in the combination with action and nonfiction (two-tailed: $t(69) = 4.42$, $p < 0.01$, $r = 0.47$; $t(69) = 2.30$, $p < 0.05$, $r = 0.27$ respectively).

Fiction Events Are Better Recognized Than Nonfiction Events

The rising event-line in Figure 2 hints to the validation of hypothesis 2a: fictional events have a stronger effect on the recognition of fiction genre than any of the nonfiction events have on the recognition of nonfiction. A t-test of the difference between the recognition of the nonfiction event and the recognition of the worst recognizable fiction event, i.e. the comic event, proved this hypothesis to be true ($t(69) = 7.42$, $p < 0.01$, $r = 0.67$). A reverse trend appeared in the relation between filmic realization and genre recognition. It was expected in H2b that the nonfiction filmic realization was recognized worse than any of the fiction filmic realizations, but the opposite proved to be true – see the filmic realization-line in Figure 2. The nonfiction filmic realization was even better recognized than the most recognizable fiction filmic realization, i.e. the comic filmic realization: $t(69) = 6.54$, $p < 0.01$, $r = 0.62$.

Genres Export to and Import from Other Genres

It was predicted in hypothesis 3a that nonfiction events would be judged to fit better as instances of fiction genres than fiction events would be judged to fit in the nonfiction genre. In other words, nonfiction events were expected to be 'exported to' the fiction genres. The results were ambiguous. When testing the mean scores of the judged fittingness of nonfiction events in drama and the drama events in nonfiction, the nonfiction event proved to fit better in a drama than vice versa: $MD = 0.26$; $t(69) = 4.6$, $p < 0.01$, $r = 0.48$ (MD = difference between the mean scores on the 5-point scale). Nonfiction then exported its events to drama, but not to action, and comic event were even imported by nonfiction ($MD = 0.18$; $t(69) = 3.18$, $p < 0.01$, $r = 0.36$), meaning that the comic event was judged to fit better in nonfiction genre than the nonfiction event was judged to fit in the comic genre.

Concerning the export of nonfiction filmic realization, hypothesis 3b, our results are more coherent. Nonfiction filmic realizations were judged to fit significantly better in the comical genre than comic filmic realizations were judged to fit in the nonfiction genre ($MD = 0.31$; $t(69) = 5.4$, $p < 0.01$, $r = 0.55$). The same holds true for

the fit of nonfiction filmic realization in drama and vice versa (MD = 0.51; $t(69)$ = 9.2, $p < 0.01$, $r = 0.74$) and for nonfiction filmic realization in action and vice versa (MD = 0.33, $t(69)$ = 6,0, $p < 0.01$, $r = 0.58$).

Unexpectedly, it turned out that the drama genre imported significantly more events and filmic realizations from the other three genres than it exported its own. Comic-, as well as action-, and nonfiction events were judged to fit significantly better in the drama genre than the drama event was judged to fit in the three genres respectively (MD = 0.69, $t(69)$ = 12.5, $p < 0.01$, $r = 0.83$; MD = 0.58, $t(69)$ = 10.5, $p < 0.01$, $r = 0.78$; MD = 0.26, $t(69)$ = 4.7, $p < 0.01$, $r = 0.49$ respectively). With respect to the import of comic-, action- and nonfiction filmic realizations in the drama genre the same holds true: MD = 0.34, $t(69)$ = 6.2, $p < 0.01$, $r = 0.60$; MD = 1.12, $t(69)$ = 20.3, $p < 0.01$, $r = 0.93$; MD = 0.51, $t(69)$ = 9.3, $p < 0.01$, $r = 0.75$, respectively.

4.5 Discussion

This study was concerned with the cues that are used in categorizing films as to genre by ordinary film viewers. In general, viewers can accurately recognize the genre of film fragments of limited duration that come without contextual information. The knowledge that viewers have of genre categories may have been developed by frequent exposure to genre differences in films and television programs. Genre recognition was demonstrated to make use of two fundamental properties of movies, namely the events represented in scenes, and the particular filmic realization of scenes.

The starting assumption that non-expert viewers recognize the genre of a film sequence by its surface characteristics, i.e. filmic realizations, has found support. In direct comparison with the obvious competitor, a film's content, i.e. the events shown in it, filmic realization proved to be the winner. Hypothesis 1, stating that the effect of genre-typical filmic realization on recognition is stronger than that of genre-typical events, was validated in a number of ways. First, all filmic realizations were recognized to fit best in their original genre, whereas some events, viz. comic and nonfiction, were not. Second, the effect of realization on recognition was found to be higher than that of events for three out of four genres, with drama as the exception. We

will return to this exception later, for now it is important to stress the limitations to the generality of the findings.

A first limitation to our study concerns the chosen length of the stimulus sequences. They were short, ranging form 8 to 24 seconds. This range is not too far removed from calm zapping through television channels, but its shortness may have negative influences on the event cue. It seems probable that on average, events need time to unfold that exceeds the range used in the present study. In regular film viewings, events develop more completely and in doing so they will gain in validity as a genre cue. Future experiments using longer sequences would be an interesting addition to the results found in this experiment. For example, the event-cue effect-line presented in Figure 2, can be expected to transpose vertically when using 30-minute sequences, while the filmic realisation effect line would be more or less the same as in this experiment. The operationalization of such a follow-up study will however be far more difficult than this study, not only to generate the material that crosses genre event and filmic realisation cues, but mainly because longer genre sequences tend to be less genre specific than shorter sequences. Each feature length genre film uses not only its own genre cues, but cues from other genres as well: an action film contains some dramatic events/ filmic realisations, while a drama film may contain some comic events/ filmic realisations.

A second limitation to the present study concerns the role of filmic realizations in this study. They were defined as the look and hear of a film as it is physically presented. The visually diminished quality and sound muteness of our material is, of course, a crude operationalization that reducing the cue strength of the filmic realisation. All we can conclude so far is that regular viewers perceive some of the surface characteristics of films, and that they must have a stock of surface characteristic examples in memory in order to match new instances with. As they may not be aware of either noticing or remembering these, it may be assumed that people have an implicit memory for pictorial surface features, as proposed by Schacter (1996). We suggest, furthermore, that the representation of realization relevant knowledge is implemented in memory in the shape of perceptual simulators, as proposed by Barsalou (1999). Further research is needed to identify the parameters of filmic realization that are responsible for genre recognition, and to answer the question as to

what degree they correspond with film-analytic categories, such as mise-en-scène, camera handling and editing.

The results of our experiment show, in accordance to hypothesis 1, that although filmic realizations were shown to be the superior cue in genre recognition, genre-typical events also have an impact on recognition. It should be noted that not all events were judged as being prototypical for their genres. The drama and action event were recognized as being prototypical for their genre, but the comical event was judged to belong not exclusively to the comic genre, even if it was judged as the most comical event within the comic genre. The nonfiction event appeared to lack any prototypicality for the nonfiction genre. We take a brief look at the differences between the effects of events in the various genres, with a view to their contribution to recognition as shown in Figure 2. Dramatic events may be the most readily recognizable because of their apparent impact on protagonist emotion. They typically involve and affect the protagonist's emotional reaction rather than her action (Bordwell, 1985). In our example, the largest part of the happy reunions consists of a display of happiness. The drama-typical filmic realization would probably be a close-up, but alternative realizations do occur, perhaps the only constant factor is the high intensity and long duration of the emotional reaction. Action events contrast with dramatic events in that they consist of actions in which the protagonists are unlimited in employing their physical capabilities and all sorts of resources in defeating evil antagonists (Neale, 2000; Arroyo, 2000). Moreover, the action event serves as a suspense initiator in the plot, focusing on the outcome of the typical action event (Carroll, 2003; Brewer & Lichtenstein, 1982). Filmic realization cues include fast editing, associated with the need to show the details of actions, to switch between views of parts and wholes of it, and to enhance the impression of speed and efficiency. The comic genre proved to be the fiction genre in which specific events have the least weight for its genre recognition. This can be explained by the comic event's function of a "loose excuse" (e.g. Horton, 1991) to hold together a series of gags. Comic events are unspecific carriers of comic filmic realizations, consisting for example of actor movements that exaggerate small imperfections of normal behavior to absurd proportions (Mast, 1979; Wells, 1998).

The discussion of effects of nonfiction event and filmic realization on recognition can best be combined with results of hypothesis 2. This hypothesis stated that a fiction scene is of more importance for the viewer's recognition of a fiction genre, than a nonfiction scene is for the recognition of the nonfiction genre. It was found to hold true for recognition by event, (Hypothesis 2a) but not for recognition by filmic realization (Hypothesis 2b). Nonfiction events are least recognizable, in relation to fiction event recognition (see Figure 2), because anything can serve as such an event. Nonfiction events are relatively close to the randomness of reality and thus have more variety in content than any fiction genre specific event can have. Consequently, the nonfiction genre will have weaker prototypical events than a (specialized) fiction genre. In contrast, the nonfiction filmic realization proved to have the strongest prototypical value. Typical nonfiction realizations stand out because the film maker is limited in her freedom to choose among shooting options. Therefore they vary less than fiction realizations and they reflect a most direct capturing of reality. Indices of this are the use of hand-held camera, follow-on action shooting, found sound (Hallam & Marshment, 2000), a low cutting rate, signs of limited control of mise-en-scène, e.g. more random or non-goal-directed movements of actors (e.g. Ashida, Lee, Allbeck, Sun, & Balder, 2001) and less outspoken emotional expressions (Tan, 2005; Oatley, 2004). Moreover, nonfiction directors will try to present filmic realizations as looking unmanipulated, in order to let the events "speak for themselves". Film viewers, on their part, are familiar with the stylistics of nonfiction because they know these from the ubiquitous supply of all kinds of reality television shows. Familiarity is so high, indeed, that it can be put to use in other genres for purposes of make-believe (as in the Blair Witch Project (1999), the Danish Dogma films and "mockumentaries").

Hypothesis 3, nonfiction filmic realizations and events are judged to fit better in a fiction genre than fiction filmic realizations fit in a nonfiction genre was supported only for the filmic realizations but not for events. The hypothesis is firstly based on the idea that fiction genres are specialized transformations of nonfiction, in terms of events and filmic realization. Non-specialized nonfiction scenes can be exported to fiction genres, whereas the way back is more difficult to go: nonfiction can import fictional events and realizations only under very special circumstances. A second argument for the

hypothesis concerns the difference in importance between fiction and nonfiction for the viewer. It can be expected that viewers are more alert in checking the nonfiction status of fragments than in checking the fiction status of a fragment. Moreover, one fictional insertion in a nonfiction film might lead viewers to change their categorization from nonfiction to fiction. One nonfiction insertion in a fiction film might be an exception in that it does not prompt such a categorization shift. Awaiting further research using other events as an independent and including viewer attention as a dependent variable, we can conclude that filmic realizations of nonfiction sequences seem to be a jack-of-all-trades. On the one hand they proved to be strong cues for recognizing nonfiction. On the other, they were recognized as fitting in the other, fictional, genres.

An unexpected finding was that drama imported events and filmic realization from other genres significantly more than it exported these. An explanation may be that drama occupies a position in between the (transformed) fiction genres and (untransformed) nonfiction genre. It uses nonfiction cues to enhance its believability and to increase its emotional impact, while it uses fictional cues to divert from common nonfiction events and intensify dramatic emotions in the filmic realization. The hypothesis of the drama genre as situated between fiction and nonfiction, with respect to transformation, will be tested empirically in a next study. In that study we will focus on the effect of distinct body movement cues, as part of filmic realizations, on genre recognition and emotional viewer impressions.

The results of this study fit within a conceptual framework of genre knowledge in which regular film viewers' experiences are cumulatively organized around prototypes that are more like concrete examples of film sequences, including dynamic perceptual detail, rather than as a set of abstract event prototypes or narrative schemas. Film viewers have embodied knowledge of genres that enables them to have detailed expectations of perceptual and emotional experiences. An underlying more abstract representation may involve a hierarchy of events and their perceptual manifestations, with real life and related nonfiction examples as a base level, branching out in various fictional event plus realization levels. When film viewers start to watch a particular movie or a short sequence of it, filmic realization acts as a cue for immediate categorization of genre, and after some

time, unfolded events may gain in value as a cue. Because it may be assumed from a mood-management perspective that viewers also categorize emotional effects, we intend to investigate the relative contributions of filmic realizations and experienced emotion on genre recognition in future studies.

4.6 Appendix

Overview of Conditions and Sequences of the Main Experiment

Genre of event (GE)	Genre of filmic realisation (GR)	Sample (SE)	Title	Description	Sec.
Comic	Comic	1	*The Rudi Carrell Show*: 1965. Dutch comic show.	Man trips over two times, rises again and trips over again.	15
		2	*Unaccustomed as we are*: L. Foster, 1929.	Laurel and Hardy stumble during a breakfast setup.	11
	Drama	1	*Sense and Sensibility*: Ang Lee, 1995.	Two women running from a hill, one of them trips over, the other helps.	11
		2	*Angela's Ashes*: Alan Parker, 1999.	A drunken husband comes home at night and stumbles in the hall.	12
	Action	1	*Proof of Life*: Taylor Hackford, 2000.	A prisoner attached to a chain runs after a girl, and stumbles.	8
		2	*Labyrinth*: J. Henson, 2000.	A girl and gnome are chased by a machine. The gnome stumbles.	13
	Nonfiction	1	*Dutch News Broadcast*: NOS, 1993.	A German minister on visit in the Africa, stumbles, and is helped.	10
		2	*Dutch News Broadcast*: NOS, 1998.	The Dutch queen proceeds with a chairwoman who trips over.	13

Drama GE	Comic GR	1	*A Day at the Races*: S. Wood, 1937.	A character reunites with an ice-cream cart instead of his brother.	18
		2	*Dumb and Dumber*: P. Farrelly, 1995.	Imaginary reunion of a clumsy man with the woman of his dreams.	20
	Drama GR	1	*Breaking the Waves*: L. von Trier, 1996.	A bride and groom reunite when the groom gets out of a small airplane.	23
		2	*Paris Texas:* Wim Wenders, 1984.	Reunion of a mother with her 10-year-old child.	13
	Action GR	1	*Terminator*: J. Cameron, 1984.	A woman reunites with a man who just escaped from a sea of flames.	21
		2	*Armageddon*: M. Bay, 1996.	Boy and girl reunite at a spacecraft airport.	17
	Nonfiction GR	1	*Dutch News Broadcast*: NOS, 1995,	Two brothers reunite at the airport. One of them was thought to be dead.	15
		2	*Dutch News Broadcast*: NOS, 1988.	A Czech mother reunites with daughter after 12 years of separation.	16

Action GE	Comic GR	1	*The Idle Class*: Ch. Chaplin, 1921.	Chase between Chaplin and a police cop in a park and through a car.	17
		2	*The Big Store*: C. Riesner, 1941.	Chase in a big department store.	12
	Drama GR	1	*A Star is Born*: F. Pierson, 1976.	Man chases a woman in a corridor to get her attention.	13
		2	*Howards End*: J. Ivory, 1993.	Man subtly chases a woman on a crowded sidewalk in the rain.	17
	Action GR	1	*Lethal Weapon*: R. Donner, 1989.	Two armed men chasing another on the street.	24
		2	*Reservoir Dogs*: Q. Tarantino, 1992.	An armed man is chased by policemen on a pavement.	19
	Nonfiction GR	1	*Brandpunt*: 1991, (Dutch current affairs programme).	Policeman on a chase at night in a Dutch city centre.	16
		2	*Dutch News Broadcast*: NOS, 1994.	Man is chased by police at border of Haiti and Dominican Republic.	14

Nonfiction GE	Comic GE	1	*Switch*: B. Eduwards, 1991.	A woman staggers in an elevator and tries to say something to man.	13
		2	*Some like it Hot*: B. Wilder, 1959.	Two cross-dressed men try to catch the elevator.	17
	Drama GE	1	*Titanic*: J. Cameron, 1999.	A woman walks in an elevator with a bellboy carrier her beauty case.	10
		2	*Autumn in New York*: Joan Chen, 2000.	A couple in love wait for the elevator.	17
	Action GE	1	*De Lift*: D. Maas, 1983.	A mechanic pushes the elevator button and all elevators open.	23
		2	*The Matrix*: L. Wachowski, 1999.	A man and woman wait for and the elevator.	10
	Nonfiction GE	1	*own recording.* University of Amsterdam, 2004.	Two women approach the elevator, push the button, wait and enter.	23
		2	*Dutch News Broadcast*: NOS, 1993.	A manager approaches the elevator, pushes the button, waits and enters.	11

CHAPTER 5: EFFECT OF FILM VELOCITY ON GENRE RECOGNITION

5.1 Abstract

In this study effects of film velocity on genre recognition were tested. 'Happy reunion' film scenes were taken from comic-, action-, drama- and nonfiction genres. Their speed was varied as to result in three levels: original velocity, acceleration by a third, and deceleration by a third. Fifty participants judged the fittingness of all scenes in each of the four genres. Velocity proved to be an effective parameter in the recognition of the comical and dramatic genre, but not of the action and nonfiction genres. As predicted, when a scene belonging to any genre was decelerated, subjects judged the scene as belonging more to the dramatic genre ($p < .01$) and less to the comic genre ($p < .01$). Acceleration of a scene belonging to any genre increased its comical fittingness ($p < .05$). The role of prototypicality of scenes, in the interaction with velocity, turned out to be only modest. In a few cases genre crossings, i.e. confusing a scene's genre with another in

recognition, resulted from velocity manipulations of non-prototypical but not of prototypical scenes.

5.2 Introduction

The genre concept is of fundamental importance in understanding media reception. Viewers of film and television seem to be able to categorize films and programs without much effort and within short time when zapping through a larger number of channels. Categorization may involve more than just a like- dislike dimension, witness the fact that viewers can indicate their preferences when presented with a list of well-known short hand genre descriptions, such as 'comedy' and 'drama' used by media providers. Attributes like life-likeness and psychological depth may be constitutive of such categories. From a cognitive psychological point of view, genres are prototype schemas (Rosch, 1978; Lakoff 1987), which are instantiated by specific textual cues. Like any schema, they guide the comprehension process and launch inferences to be answered by information that is still to come (van Dijk, 1980). At a less conscious level, the schema may prime the viewer's attention, perception and inferences (Roskos-Ewoldsen & Dillman-Carpentier, 2002). Analytical genre research from the humanities has further added to our understanding of film genre, the topic of our research, as a cognitive schema that shapes expectations as to story development, and outcomes of major events and actions (Grodal, 1997). Comprehension of any film consists in large part in matching incoming events with these expectations (Allen, 1995; Neale 2000). Lasting mismatches result in reclassification into another or even a new genre (Altman, 1999). Knowledge of genre may be so important for comprehension that one and the same event, e.g. the misfortune of a protagonist, say stumbling over an obstacle, is appreciated in quite different ways as funny or tragic. Genre classification is not only essential for comprehension of films but also for the viewer's emotional experiences (Grodal, 1997). Film genres rest in large part on typical configurations of emotion potentials, or affect structures (Tan, 1996). In line with the mood management functions of film viewing (Zillmann, 1988), it may be expected that people use genre knowledge, including emotion potential, in the selection of films that improve

their current emotional states. Given the centrality of genre classification in reception at large makes it implausible that it only takes place after viewing an entire film. Piecemeal categorization, gradually increasing in certainty and level of detail seems to be more probable.

Hardly any research has been devoted on the question what attributes are used by viewers in classifying films as to genre. Researchers from the humanities have proposed widely varying attributes such as plot and setting, iconography, and film style (E.g. Altman, 1999). Our own research aims at revealing the effectiveness of an actor's body movements. In a series of experiments we try to establish parameters of actor movement responsible for generic and affective viewer impression. We suppose that once these parameters are identified, rendering specific configurations of these will result in a predictable genre impression. By implementing the configurations into 3D animation software, it should be possible to adapt any animation scene easily to any genre.

In this experiment, we presented informants with a number of film scenes portraying one event, a happy reunion. The scenes were taken from various genres. They differed as to film velocity and typicality for a genre. Participants were asked to judge the scenes' fittingness in each of the genres. The dependent variable is genre recognition, rather than categorization. In a categorization task, informants are asked to sort stimuli into a number of classes. In contrast, we had informants indicate the appropriateness of current genre labels: comedy, drama, action and nonfiction to film scenes they were presented with. The independent variables are film velocity, a priori typicality of scenes for a genre, and to be recognized genre. Velocity is an interesting candidate because it is instantly perceived, even when the viewer is presented with a short film scene, whereas other potential genre cues, e.g. plot, need more exposure time in order to be effective. Film velocity refers to the rate of frames as a scene is projected, as compared to the frame rate when the scene was shot. In normal velocity the projection rate is equal to shooting rate; in high velocity ('fast motion') it is higher, in low velocity ('slow motion') lower. In our experiment we presented a normal speed, an accelerated and a decelerated version of a scene. Early film psychology literature already stressed the dependency of the expressive quality of a gesture on its projected speed (Arnheim 1934). This claim is supported in

practice by the intuitive use of velocity variation by filmmakers throughout the 20th century. Fast-motion, produced by projecting events at a faster frame rate than they are shot at, is used as a technique by filmmakers to heighten the comic effect of a scene, whereas slow-motion techniques are used to make a scene look more tragic (Gianetti 1999). We assume that film velocity is in fact a stand in for another cue, namely speed of movement of actors. Using live action films prohibits direct manipulation of actor movements; in subsequent research we use animation techniques to this end (Visch & Tan, 2006b).

As a second independent variable, the genre of scenes was varied. Three of the most popular genres were chosen from the most widespread system of high-level classification used in television guides and film encyclopedia and databases: drama, action and comedy. As a contrast genre, we altered the current documentary into 'nonfiction', for reasons to be explained. As a third independent variable, presented scenes could be either more or less prototypical. The prototype schema conception of genre implies that some films are better instances of a genre than others, in other words, their 'goodness of category membership' varies (Rosch, 1978), and the same goes for separate film scenes. Prototypicality involves all attributes mentioned in analytical research mentioned above, and others. An ideal prototypical scene has all attributes or attribute-values mentioned in critical analyses as typical for the genre. All members of a genre category are prototypical to the degree they possess the attributes of the prototype while lacking those of other genres. Two degrees of prototypicality, i.e. prototypical and non-prototypical scenes, were established a priori and informally by the researchers, using encyclopedia descriptions and content analysis.

Our main and first hypothesis is that speed of movement of actors serves as cue for genre recognition. The hypothesis is based on an expressive effect of velocity that is widely found in other art forms, like music and dance. Slow music is sometimes experienced as "sad, calm or dignified" whereas fast music is experienced as exciting, agitated or joyful and triumphant (Kreitler & Kreitler 1972). The 19th century dance theoretician François Delsarte stated in his Law of Velocity that profound and serious emotions require slow movements, while petty and light emotions would be elicited by fast movements (Shawn 1974).

Our second hypothesis is also based on the literature just mentioned, and specifies the scope of velocity effects: velocity variation will be most effective as a genre recognition cue for the dramatic and the comic genre, because the emotions affected by it are typical for these genres only.

Our third hypothesis is that variations in film velocity have effects on recognition of the dramatic genre reverse to that of the comic genre. Acceleration of a film scene will lead to an increase in the comical recognition and a decrease of drama recognition, while deceleration will have the opposite effects.

A final aim of the research was to explore recognition shifts from one genre to another. Two issues will be explored. Firstly, if velocity manipulations affect genre recognition, then an important question is whether accelerated or decelerated versions of any scene fit better in another genre than the original does. For instance, deceleration might render a comic scene less so, to the point of becoming dramatic. Our research design, in which all scenes are judged as to fittingness in all genres, allows for an investigation of such genre recognition shifts. Of course, non-prototypical scenes will be more prone to such 'false recognitions'. (We use quotation marks here, because our method differs from the well-known recognition research paradigm, as we shall see.) We expect, as our fourth hypothesis, that if genre recognition shifts occur, they will be the result of velocity manipulation of non-prototypical scenes rather than of manipulation of prototypical scenes. Secondly, an underlying theoretical assumption about the genesis of genres and its influence on their perceived relations and categorization may be addressed by the results. It holds that drama, comedy, action, and other fictional film genres involve some systematic transformation of nonfiction film genres, such as news, documentary and amateur movies (Visch & Tan, 2006b). Nonfiction does not have any strong prototypes, and therefore serves as a neutral basis from which events and their realization can be 'exported' to fiction genres.

The weak prototypicality of nonfiction scenes renders their export to fictional genres relatively easy; only minimal changes may be required to make them look acceptable in a target genre, be it as non-prototypical scenes. In contrast, especially prototypical fiction scenes need a lot of 'neutralizing' in order to pass for nonfiction scenes. A major prediction to be made from the assumptions is that

nonfiction scenes tend to be recognized as fiction scenes to a higher extent than fiction scenes as nonfiction ones, regardless of velocity.

The exploration of the nonfiction to fiction transformation is also the reason why we replaced the documentary with the wider nonfiction category in the operationalization of genre in this research.

5.3 Method

Genre and prototype

We selected for each of the three fiction genres a prototypical and a non-prototypical scene and for the nonfiction genre two prototypical and two non-prototypical scenes. The genres conform to a classification currently in use in film and broadcasting industries and institutions. It should be noted that this classification is global and inaccurate in view of basic knowledge about genres available since Aristotle. In particular, it confuses Aristotelian tragedy with 'drama' (for a clarification of the latter two terms see Zillmann, 1998). We adhered to this misunderstanding because it may be expected that non-expert informants could deal better with this classification because it is common in film publicity, such as program guides, film lists and so on. From this classification we selected categories action, drama, comedy, and nonfiction, acknowledging that 'tragedy' would be the appropriate name for 'drama'. Prototypicality of scenes was determined by the researchers, starting on suspected "goodness of membership" (Rosch 1978) of the scene for a specific genre. That is, prototypical scenes should have as many attributes characteristic for the genre, and as few characteristic for other genres as possible. An ultimate operational criterion was that prototypical scenes should be most easily recognizable by viewers in terms of genre, while non-prototypical scenes should not. Prototypicality, then, did not only depend on bodily actor movements but also, and probably even more so, on other genre-specific attributes, such as characterization, setting and props. For example, a scene with broad-breasted Arnold Schwarzenegger carrying a gun was chosen as a prototypical action scene, while a scene from Tarantino's Reservoir Dogs where two men reunited in an office was chosen as a non-prototypical action scene. Appendix A lists the scenes that are used in the experiment.

Velocity Manipulations

The velocity of the original film scenes was manipulated by varying the number of frames displayed per unit of time. The number of original frames was decreased in order to achieve acceleration, and increased, by copying original frames, to achieve deceleration. A proportional variation of film length resulted. The amount of velocity variation was chosen such that the participants wouldn't notice that an original version had been altered as to velocity. Informal post-session interviews revealed that the majority of the participants had not noticed the manipulations. The levels of velocity were: (a) acceleration by a third, (b) deceleration by a third and (c) original velocity.

It is important to note that not only actor movements were accelerated or decelerated but the velocity of all other movements and changes of the scene as well.

Materials

Three fiction genres feature in this study: action, comic and drama. The selected scenes should occur at least in these three genres. Moreover, the scenes should occur in reality, represented by the nonfiction genre, as well, because of our working hypotheses is that nonfiction serves as a base for transforming material into fiction. Scenes like *happy reunions, running chases* and *love at first sight* appeared to satisfy our requirements. In the present experiment *Happy reunion* scenes were used as stimulus material. Fiction film material was collected from diverse mainstream and art house features throughout the 20th century, using encyclopedia and critical sources. Nonfiction film material was taken from news items and documentaries and in part shot by the first author at an airport arrivals terminal. A database was created of about 200 items from comic, drama, action and nonfiction genres. Analysis of the *happy reunion* scenes, using encyclopedic and critical sources, yielded insight into their prototypical structure. The action portrayed consisted of consecutive phases: recognition, approach, physical contact and informative explanation - see appendix B for a more detailed

description. All scenes used in the experiments were structurally complete as to these phases.

A total of ten original scenes were selected: for each of the three fiction-genres comedy, drama, and action there were a prototypical and a non-prototypical scene. For the nonfiction genre the number of scenes was doubled, in order to compensate for the relative fuzziness of the category, so there were two prototypical and two non-prototypical nonfiction scenes. Ten accelerated and ten decelerated versions were added tot the ten originals. All in all, 30 scenes served as a stimulus set.

As can be seen in appendix A the length of the ten unmanipulated scenes varied from 6 seconds for the non-prototypical nonfiction scene to 26 seconds for the prototypical drama scene. When we applied the velocity manipulation the range of the scene length expanded subsequently from 139 frames (4 seconds) to 859 frames (35 seconds). As a consequence, scene length was to be controlled for in the analyses.

Image Distortion

In order to focus the viewer's attention on the body movements of the actors we distorted the image quality of all the scenes – see Figure 1. Genre cues like lighting, the actor's face, color and setting details were minimized in this way, while the actor's bodily outlines were emphasized, rendering body movement more salient. For details see appendix C.

Figure 1. Image Distortion Example.

Measures

Genre recognition was measured as the judged fittingness of a scene in subsequently the drama genre, comic genre, action genre, and nonfiction genre using five-point scales (1 : very bad genre fit; 5: excellent genre fit). The four scales were presented with each of the 30 scenes.

Quality judgment was added as a control measure in order to check for quality differences among the scenes possibly confounding with the genre recognition results. For each of the 30 scenes five-point rating scales concerning the overall quality of the footage were presented. It was explained to informants that they had to judge the quality of each scene in a broad sense, comprising concepts like: image quality, clearness of action, beauty, actor skills, etc..

Design

To control for potential order effects half of the participants saw the scenes in one order, while the other half saw them in reverse order. Participants were randomly assigned to the two order conditions. The overall design of the experiment is Velocity (3) x Genre (4) x Prototypicality (2) x Order (2) x Gender (2), with the former three as within subjects factor and the latter two as a between subjects factor, and fittingness in the four genres as within subject dependent variable.

Procedure and Participants

Participants were tested in small groups. Each scene was presented two times separated by a short interval, immediately after the second presentation the five questionnaire items were presented. A complete session lasted about 45 minutes.

Fifty volunteers participated in the experiment. Six of them were excluded because they skipped a considerable part of the questionnaire or because they deliberately filled in wrong answers. Forty-four subjects were finally used in the statistical analyses.

From this total of 6600 answers (44 subjects x 30 scenes x 5 dep. var.), 12 answers missed and one subject did not fill in the quality judgments. Because we used repeated measure analyses, and needed an answer on every question from each participant, we rectified the missing values by means of regression imputation. The final sample of 44 consisted of 14 males and 30 females. 25 saw tape order I and 19 tape order II.

The (Dutch) participants consisted of students of a Rotterdam High School (mean age about 19 years) and staff of Vrije Universiteit Amsterdam and Technical University Delft (mean age about 29). All informants were naïve as to the purpose of the study and randomly assigned to the conditions.

5.4 Results

We used General Linear Model Repeated Measures as the main statistical procedure, with genre fittingness judgments as the within subjects dependent variable; velocity, genre, and prototypicality as within subjects factors; and order and gender as between subjects factors. The advantage of this procedure is that the effects of all factors can be computed in one general model that corrects for mutual effects between them. Another advantage is that Repeated Measures corrects for answer trends between all participants (Stevens 1996). The disadvantage of the method is that the procedure does not allow for post-hoc test. To obtain detail effects between the levels of the factors we performed paired sample T-tests of the relevant factors. Before the analyses, the data for the dual nonfiction scenes were combined for each informant to yield average quality and genre recognition scores for quality and for genre recognition. It should be noted that genre features twice in the analysis, 1) as genre fittingness judgment, a set of four variables forming the dependent within subjects factor, 2) as an independent factor, the original genre from which the stimulus scene was taken. When necessary we will refer to the second as a factor 'genre of scenes'. The repeated measures analysis of variance was carried out with genre fittingness as a dependent variable and velocity, genre of scenes and prototypicality as independent factors. The main effect of genre fittingness was significant, F = 40.47, p < .01, which only means

that there were overall differences among the four genre fittingness judgments. Because this factor is a dependent within-subjects variable, this is the only possible main effect of the analysis, while the effects of independent factors (genre, prototypicality, velocity, gender and order) on the genre fittingness judgments are interaction effects. As the sphericity assumption of the two-way interactions, of which one factor is the genre fittingness judgment, is violated, we restrict ourselves to the multivariate approach of the repeated measures analysis (Stevens 1996).

Checking Control Factors

Neither gender nor order had a significant two-way interaction with the genre fittingness judgments (F = 1.31, p = .28; F = 0.46; p = .76, respectively). Unintended effects of velocity manipulations on the participants' quality judgment could be excluded too (F = 1.88, p = .17). However, there appeared to be 4 significant out of 96 higher-order interactions, in which gender or order is a factor. To compensate for these effects the factors order and gender will be taken in as covariates into the final analyses.

We tested if scene length confounds with genre fittingness judgments by obtaining their correlation determinants r^2. The strength of these correlations appeared to be far too weak to influence the judgments: r^2 = .01, .01 and .00 (N=1320) respectively. We conclude that scene length did not act as a cue for differentiating genres.

Two-Way Interactions of Velocity and Genre Fittingness Judgments

Figure 2 offers an impression of the two-way interaction of velocity and the genre fittingness judgment made by the participants. This figure presents a two-way effect and therefore does not differentiate between the factors prototypicality and genre of the scenes, but presents the effect of velocity manipulation on the genre recognition of *any* scene. This interaction is not significant (F = 1.24, p = .31) and rejects our first most general hypothesis that film-velocity

serves as a genre cue and consequently alters the genre fittingness judgment of any scene.
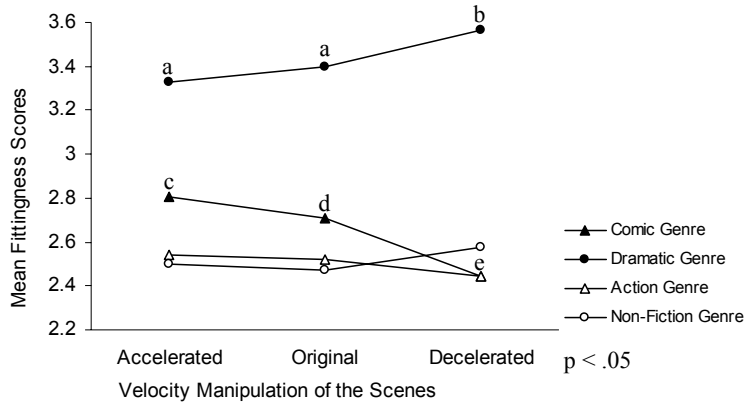
Figure 2. Effect of Velocity Manipulation of any Scene on Genre Recognition.

When looking more in detail at the four genre fittingness judgments in figure 2, it shows that the participants are influenced by velocity manipulation in their judgment of fittingness in the comical and dramatic genre. These three-way interactions involved are significant (F = 20.03, p < .01; F = 8.74, p <.01, respectively). Paired sample T-tests show that deceleration of velocity unmanipulated scenes results in a significant increase of the dramatic fittingness judgment (t = 2.79, p < .01), while deceleration results in a significant decrease of the comical fittingness judgment (t = 5.52, p < .01). Acceleration of an unmanipulated scene increases the comical recognition significantly (t = 2.31, p < .05) but does not affect the drama fittingness judgment significantly. Our second hypothesis, film-velocity will be most effective as a genre cue for the dramatic and comic genre, then, is validated in part, since velocity manipulation did not have any effect on the genre fittingness judgments except for the comic and dramatic genre fittingness judgment. Our third hypothesis, velocity variation has a reverse effect on recognition of the comical vs. the dramatic genre is validated by the difference in direction of the velocity effect for the two genres – see figure 2 (linear orthogonal polynomial contrast: F = 3.14, p < .05).

Prototype Interactions and Genre Recognition Shifts

We expected that prototypical scenes of a specific genre have an optimal velocity for recognition in their own genre. When this optimal velocity is altered, either by acceleration or by deceleration, recognition of the scene in its original genre should decrease. Figure 3 shows that this can be signalled as a trend for all genres. However, only for the comic genre of scenes this effect is significant (F = 4.62, p = .02). We therefore conclude, on the one hand, that the variable velocity is a fundamental characteristic of a comical prototypical scene. On the other hand, we have to conclude that this fundamental role of velocity in a genre prototypical scene is specific for the comical genre - in contrast to its role of velocity in the prototypical scenes of the other genres.
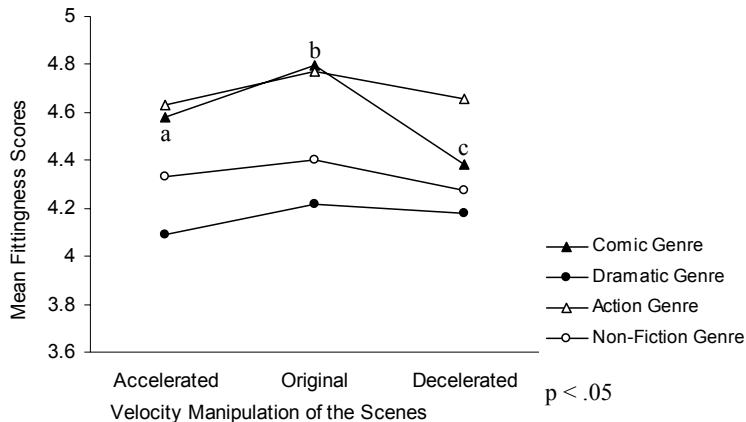
Figure 3. Fittingness Judgments of Prototypical Scenes in their own Genre.

It was also expected that prototypical scenes were resistant to velocity manipulations, relative to non-prototypical scenes, because the latter have less genre typical attributes than the former. In line with the expectations, manipulations of the velocity of non-prototypical scenes proved to have almost twice the effect on genre recognition than manipulations of the velocity of prototypical scenes (effect size η^2 is 0.63 and 0.32 respectively). In light of the above-

mentioned strong effect of deceleration, it can be expected that some decelerated non-prototypical scenes will be recognized as belonging to the dramatic genre instead of their original genre. Detail analyses showed that such a genre recognition shift occurs. Decelerated non-prototypical comic- and action-scenes were judged to fit significantly better in the dramatic than in their original genre ($t = 2.11$, $p = .04$; $t = 2.24$, $p = .03$, respectively).

The 'Export Nature' of Nonfiction

An underlying assumption of our research is that nonfiction scenes form a base from which fiction genres can import and transform according to their own specific requirements (Visch & Tan, 2006b). For each genre the prototype genre fittingness PGF was determined, that is the ratio between fittingness of prototypical scenes within the genre and mean fittingness of the same scenes in the remaining three genres. In an analog way, the non-prototype genre fittingness, or NPGFs were determined for each genre. In line with the hypothesis, it was predicted that the difference between PGF and NPGFs for the nonfiction genre would be lower than that for other genres. This difference can be named the prototype strength of a genre. The data showed that prototype strength of the nonfiction genre is significantly weaker than the prototype strength of the three fiction genres together ($t = 8.08$, $p < .01$). Pairwise comparisons showed that it did not appear to be significantly weaker than the effect of prototype in drama. This weakness of prototypes in drama and nonfiction may be due to the relatively easy scene exchange between those genres. In a subsequent study (Visch & Tan, 2006b) we will propose that drama functions as an exchange bridge between the nonfiction and fiction genres. A second prediction from the export-from-nonfiction hypothesis is that unmanipulated nonfiction scenes are recognized to fit better in the fiction genres than unmanipulated fiction scenes fit in the nonfiction genre. This difference proved to be significant (mean fits were 2.37 vs. 1.84 respectively; $t = 4.84$, $p < .01$). We consider the result as an illustration of the general export and recognition asymmetry between nonfiction versus fiction genres.

5.5 Discussion

Our findings confirm our hypothesis that velocity is an effective cinematic parameter for the recognition of the comic and the drama genre. When a scene was decelerated, it was judged as fitting better in the dramatic genre and worse in the comical genre than when the scene was presented at its original speed. When on the other hand, a scene was accelerated, participants judged the scene as fitting better in the comical genre than when presented at original speed. The comical fittingness of a scene was affected by both velocity manipulations while the dramatic fittingness was only by deceleration. Concerning comical velocity, our research suggests that velocity is a major attribute of the comical prototype with an optimal value: when the velocity of a comical prototypical scene was altered in either way, the fittingness in the comical genres decreased significantly. To our knowledge, the results are the first empirical support from a controlled experiment, in which content factors are kept constant, for the strong intuitions that film makers have about suitability of velocities of actor movements for genre recognition.

The described effects of velocity are general genre effects based on the velocity manipulation of an isolated narrative event. When we compare our findings to genre feature films we have to be aware of two constraints. The first is that a film belonging to any genre, as a whole, may contain some units that belong to other genres. For instance, we can find slow movements in dramatic scenes of an action movie, like the decelerated happy reunion scene in Armageddon (Bay 1998). And fast movements may occur in the comic scenes of a dramatic movie, like the sex scene in A Clockwork Orange (Kubrick 1971). The second constraint is that our research is concerned with typical effects of velocity on genre impressions and does not apply to velocity manipulations in every particular film. In line with our hypotheses, acceleration or fast-motion is often used to create a comic effect, like in the famous assembly line scene in Modern Times (Chaplin 1936). But acceleration can also be used for other, atypical, purposes as well, e.g. to summarize events (the scenes displaying the building of cars and weapons in the television series of the A-team (Cannell 1983-1987); to focus on abstract patterns of movement (Man With a Movie Camera (Vetrov 1929), Koyaanisqatsi (Reggio 1983)); to suggest supernatural power (Nosferatu (Murnau 1922), Donnie

Darko (Kelly 2002)); or to suggest the fast and short effect of drugs (Requiem for a Dream (Aronofsky 2000)). Deceleration likewise may have a number of other purposes than just to dramatize (as in the drowning scene in Roeg's drama film Don't Look Now (Roeg 1973)). Slow-motion is often used in sport reporting to view an original fast movement in detail or in action movies to show explosions or fighting scenes in detail (Face/Off (Woo 2000), the Matrix (Wachowski 1999)). We hypothesize that the use of slow-motion in action scenes not only provides the viewer with a detailed account of the action, but also increases the aesthetic value of the scene. Additional research into this hypothesis is planned. Finally, slow movements can even be used as a comic effect as for instance in Parade (Tati 1974) where Tati mimes in slow motion a tennis star's play. A related velocity effect is the so-called comical 'double take' in which an actor delays his reaction to an event or object to increase his subsequent surprise. Examples can be found in almost all Laurel and Hardy films. Probably the initial, and inappropriate, slowness of the actor's reaction in combination with the viewer's expectation of the actor's fast and exaggerated reaction that is to come, gives rise to the comic effect.

Concerning genre relations, we gained some insight in the relation between fiction and nonfiction. Results showed that nonfiction scenes are judged to fit better in fiction genres than fiction scenes fit in the nonfiction genre. This asymmetrical exchange relation can be explained by our assumption about the genesis of genres, namely that fiction scenes are a transformation of neutral nonfiction scenes. Fiction scenes contain nonfiction materials, like settings, dialogues or velocities of movements changed beyond recognition in many respects. Nonfiction scenes, in contrast, are not yet transformed, so that they fit relatively well in any fiction genre.

Although velocity variations proved to be an effective determinant of genre recognition, effects were not strong enough to cause ubiquitous genre recognition shifts. Genre crossings only appeared by deceleration of non-prototypical action and comic scenes. Due to their deceleration, participants judged these scenes to fit best in the drama genre. We suppose that genre recognition shifts did not occur with genre prototypical scenes, because in the prototypical scenes cues like setting and plot have overrun the effect of velocity.

Our future research will aim at revealing the nature and effect of these cues as far as they relate to actor movement. An application of

such knowledge would be the implementation of these cues as parameters in animation software. When we subsequently configure the parameters experimentally for each genre impression, animators, and even non-professionals, could transform any animated scene into any genre by a single mouse click.

Finally, our future research will more directly address the question whether speed of movement is an ultimate cue of genre. First, it may be that emotional processes mediate between the perception of speed and genre recognition so that we will have to establish whether it is speed of motion per se, or some expressive quality affected by it that acts as a cue for genre recognition. Research of pacing of events in film (de Wied, 1991) and television programs (e.g. Lang, Schwartz, Chung & Lee, 2004) has demonstrated significant effects on viewer arousal. In the latter as well as in other studies pacing of events was manipulated through alterations of scenes, shots, and camera viewpoints (for an overview see Lang et al., 2000). And de Meijer (1991) demonstrated that velocity is a distinct body movement parameter in the emotive viewer impression. Fast body movements were correlated significantly with anger, joy and surprise, while slow movements correlated with grief and sympathy. In relation to our first hypothesis, these findings imply that it is not the speed of movement itself but an emotional quality related to it that acts as a cue for genre recognition, just as Kreitler & Kreitler (1972) and the dance theoretician Delsarte (Shawn 1974) would have it Of course, velocity of movement is just one out of numerous factors contributing to genre-specific emotion. There is a body of research devoted to these factors in various genres, such as the film viewer's disposition for empathy (Oliver, 1993; de Wied, Zillmann & Ordman, 1995), momentary concerns while viewing (Goldenberg et al. 1999) to name just two examples of research dealing with the combination of sadness and enjoyment characteristic of viewing tragic drama.

Second, the results of Lang's et al. (2000; 2004) just mentioned research suggest that if speed of motion affects viewers' genre recognition and/ or emotions, it is not an isolated variable, but part of an entire package of speed factors that influence viewer arousal and emotion, which in turn may be the ultimate cue for genre recognition. In order to sort out these relations, other dependent measures would have to be added to genre recognition, notably emotion ones, in order to support our contention that movement speed cues genre

recognition via emotions, as stated in our second hypothesis. Finally, speed of movement would have to be manipulated independent from other velocity and content factors. Such a study will be reported in Visch and Tan (2006b).

5.6 Appendices

APPENDIX A

List of Used Scenes as a Basis for the Stimuli

scene description	source	genre	proto-typical	length (sec./frames)
A character reunites with a horse, after which he runs with arms outstretched apparently to his brother but actually to ice-cream cart next to his brother.	*A Day At The Races*: Sam Wood, 1937	comic	yes	16.20
Imaginary reunion of the clumsy protagonist with the woman of his dreams on a doorstep.	*Dumb and Dumber:* Peter Farrelly, 1995	comic	no	8.00
Reunion of two former lovers in a romantic room in the desert.	*The English Patient*: Anthony Minghella, 1996	drama	yes	25.22
Reunion of a mother with her 10-year child in front of a window in the city at evening.	*Paris Texas*: Wim Wenders, 1984	drama	no	22.04
The broad-breasted protagonist shoots his enemy who holds his wife, after which he reunites briefly with her.	*True Lies*: James Cameron, 1994	action	yes	18.01
Reunion of two criminal friends in a classy office.	*Reservoir Dogs*: Quentin Tarantino, 1992	action	no	21.11
Reunion of a released Bosnian Serbian criminal with his family in his apartment in Sarajevo.	Dutch News Broadcast, 1996	nonfiction	yes	25.08

Two French pilots, who were captured by the Bosnian Serbian, are united with their family on an airport in Paris.	Dutch News Broadcast, 1995	nonfiction	yes	25.19
Rwandan father is united with his 8-year old daughter he had supposed to be a deadly victim of war.	Dutch News Broadcast, 1994	nonfiction	no	7.14
Muslim soldier reunited with his mother on a public square after his release of Croatian imprisonment.	*Nova* (Dutch news program), 1994	nonfiction	no	6.06

APPENDIX B

Succeeding Phases of the *Happy Reunion* Scene

I   Recognition
- *Physical distance between the characters: 2 – 6 meter.*
- *Mutual recognition, exchange of gazes, and realization of each other's presence.*

II   Approach
- *Accelerated walk followed by short deceleration and stopped short at about arm length.*
- *Characters are looking at target, route or environment - depending on the intensity of the intention to reunite.*

III   Physical contact
- *As a prelude to the contact the characters exchange 2 or 3 small steps or weight-balance shifts to communicate the intention to embrace, and to agree on the type of embracement.*
- *Variations on the following actions: handshaking, embracement, (alternated) kissing, head between hands, turning each other around, lifting each other from the ground, watching each other's gaze closely.*

IV   Informative explanation
- *Embracement is released but some physical (hand) contact is often maintained. Question/ answer dialogue about past and/or present and/or future.*
- *This phase often finishes with a collective walk towards a private place while hand/ shoulder contact is maintained or slowly released.*

APPENDIX C

Image Distorting Video Filters

In the video-editing program Adobe Premiere 5.0 the following filters were set:
- convolution kernel: find edges
- black and white
- brightness and contrast: -4 and 9 respectively.
- color balance: r = 0, g = 200, b = 200 (%)
- clip: top = 18, bottom = 23 (%), fill color = black

CHAPTER 6:
CATEGORIZATION OF FILM AS FICTION INVOLVES PERCEIVING DEVIATIONS FROM NONFICTION

V. T. Visch & E. S. H. Tan.
Article in revision for Cognition.

6.1 Abstract

We investigated the influence of perceived movements on genre categorization and emotional-/ aesthetic impression in film viewing. In an animated film scene, movements of an object were varied, starting from a neutral basis, as to parameters: velocity, efficiency, fluency, detail and deformation. Results showed that genre categorizations depended on these parameters. Neutral movements were judged to fit best in the nonfiction genre, and to have a fittingness score declining from nonfiction to drama to action to comic. The size of deviations from the neutral movements determined the particular fiction category scenes were judged to fit in: small and moderate deviations resulted in categorization as drama and action, large deviations in comedy. In addition, genre categories appeared to be organized in three underlying affective dimensions: excitement (action genre), realism (nonfiction and comic) and sentiment (drama). In order to explain results it is proposed that 1) the distinction between fiction and nonfiction categorization is mentally represented as a deviation from realistic percepts; 2) deviations are interpreted as transformations of realistic nonfiction percepts specific for each fictional genre; and 3) transformations are linked to specific emotions. The results fit in a communicative framework in which viewers recognize film makers' intentions as to emotional effects and reality transformations for realizing these.

6.2 Introduction

Anger and sadness of persons perceived in the dark can easily be told apart by the movements of their bodies. We do not need to see the whole body to recognize the expressed emotion: movement of a part, like a hand, will suffice (Pollick, Paterson, Bruderlin, & Sanford, 2001). Even non-biological movements of abstract stimuli lead viewers to high-level attributions including animacy, emotions, causality, and intentions (Heider & Simmel, 1944; Michotte, 1963; Opfer, 2002; Scholl & Tremoulet, 2000). Visualizing a body by only a dozen moving point lights enables recognition of expressed emotions (Dittrich, Troscianko, Lea, & Morgan, 1996), gender (Johansson, 1973; Barclay, Cutting & Kozlowski, 1978) and deceptive intentions (Runeson & Frykholm, 1983; Richardson & Johnston, 2005). It is only natural to assume that body movements in films tell the audience about the inner life of the characters. The mentioned finding that deception is communicated through movement leads one to suspect that film viewers can recognize subtle cues as to how to interpret shown events and even an entire movie from movements. However, little experimental research has been performed on the effects of movements on film viewers. The present research will make a start by studying the influence of movements on viewers' film-genre categorization, especially fiction/ nonfiction, and emotional- and aesthetic impression. It addresses the question whether specific movements are subject to sensory re-enactment (Barsalou, 1999, 2003) in the service of genre classification.

Genre categorization is of fundamental importance in film viewing. It is said to prime attention (Roskos-Ewoldsen & Dillman-Carpentier, 2002), to affect modes of perception (Hawkins et al, 2005), to generate narrative expectations (Grodal, 1997) and emotional moods (Tan, 1996; Smith, 2003; Zillmann, 1988; Oliver, 2005). One and the same scene, for instance a chase, may elicit laughter, admiration or sadness, when categorized as comedy, action or drama, respectively. When categorizing a film in a specific genre, the most important distinction the viewer will make, is whether the film belongs to a fiction or to the nonfiction genre. Although most film theorists distinguish nonfiction from fiction by its institutional context (e.g. Plantinga, 1997; Nichols, 2001; Carroll, 2003), there are theoretical reasons to believe that genres also differ in their use of stylistic

features such as editing, camera handling, actor movements, speech and so on (Neale, 2000; Lacey, 2000; Altman, 1999). Visch & Tan (in press, 2006) showed that non-specialist viewers have the ability to use these stylistic features to accurately categorize films as to genre. Moreover, it was shown that genres are predominantly categorized by formal cues, such as camera- and actor-movements, and to a significantly lesser degree by genre typical events, such as a chase (Visch & Tan, 2006a). Genre recognition studies in literature (Hayward, 1994) and music (Dalla Bella & Peretz, 2005) similarly showed that non-expert readers and listeners can accurately recognize genres by stylistic properties.

We propose that the mental representation of fiction and nonfiction is based on a distinction between reality and filmic transformations of it. Nonfiction directors are believed to try to capture reality and transform it to a minimal degree. In order to preserve coherence and attention some transformations like selection, framing and continuity editing cannot be avoided (Corner, 1995). Fiction, on the other hand, transforms reality to a higher degree into fiction characteristics. As a consequence, references of a fiction feature to reality are seen as more indirect and complex than nonfiction references, and as a consequence more open to "art-characteristic" metaphorical interpretation on the part of the viewer (Singer, 1998; Branigan, 1992; Goodman, 1984; Dewey, 1934). A fiction genre's characteristics and function determine the extent of the transformation of reality. In our experiment we tested recognition effects of transformation of three fiction genres, drama, action and comedy, in relation to nonfiction. The (sentimental) drama genre can be supposed to contain most nonfiction features and movements, due to its function to raise empathy and compassion. Realism is apparent in drama's characteristic to portray the reality of everyday life (Tan, 1996; Lacey, 2000; Neale, 2000) and in its realistic acting: such as Method acting by Stanislawski & Strasberg (Wexman, 2004) or the use of non-professional actors (e.g. Italian Neorealism films or the films of Jean-Luc Godard and Ken Loach (Hallam & Marshment, 2000)). The action genre's relation to realism and nonfiction is determined by its function to impress viewers. Some degree of similarity with real-life events would probably facilitate the potential for impressing. Physical action ("whammoos"), determination and efficiency (Neale, 2000; Arroyo, 2000; Bordwell, 2006) are among the elements enhanced in

comparison with nonfiction. The comic genre's relation to nonfiction is the most remote. Its function, to make people laugh, is served by surprising and absurd deviations from social conventions (Palmer, 1987; Neale & Krutnik, 1990). Comic acting typically involves physical inventiveness and unlimited exaggeration (Sobchack, 2004) resulting in inappropriate, "alienating", behavior of the comic character (Naremore, 1988).

Given these genre theoretical characteristics, we formulated two predictions: (a) a Realism prediction concerning the amount of realism specific for each genre; and (b) a Transformation prediction, concerning the amount of deviation from nonfiction specific for the fiction genres. Concretely, the Realism prediction states that untransformed neutral movements will be classified as fitting best in the nonfiction genre, and to have a declining fittingness score from nonfiction to drama to action to comic. The Transformation prediction states that moderate transformations from nonfiction scenes are associated with fittingness in the genres drama and action, while strong transformations are associated with fittingness in comedy.

6.3 Method

Materials

Stimulus materials consisted of twenty-one 3D animation scenes, constructed with MAYA 6.0 software, of a chase between two blocks, lasting twenty seconds. Figure 1 shows a still. The choice of manipulated movement parameters was inspired by analysis of chases from various genres, personal interviews with animators, literature on animation (Thomas & Johnston, 1981; Williams, 2001); film (Bordwell, 2005; Gianetti, 1999); acting (Naremore, 1988; White, 1985; Shawn, 1974); artificial agents (Allbeck & Badler 2003; Ashida, Allbeck, Sun, & Badler, 2001; Hille 2001); and psychological aesthetics (Kreitler & Kreitler, 1972; Pollick et al, 2001; Meijer, 1989). They were velocity, efficiency, fluency, detail and deformation. For each of these five parameters we made four animations each deviating from one neutral scene in one or the other direction. Deviations could be moderate (+ or -) or strong (++ or --) Differences were exponential except for the efficiency parameter.
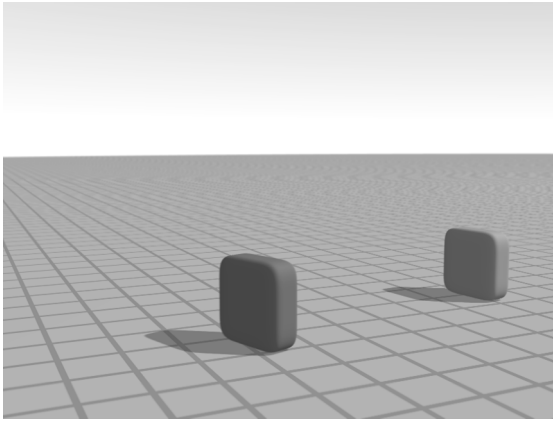
Figure 1. Still of Animated Running Chase.
The neutral chase follows the following script: (a) A moves to the position of B while B moves away from A; (b) the distance between A and B becomes shorter over time until A and B are unified at the end of the chase; (c) as the distance between A and B becomes shorter, B takes more and more corners that become shorter and sharper toward the end of the chase.

The Neutral Scene

To animate the neutral scene about 80 chases were gathered from films of various feature genres and from nonfiction material (e.g. news, sport, documentaries, and animals) provided by the Dutch public television archives. Analysis of the examples informed a unified script acting as the basis for all animations – see Figure 1. The neutral animation was created with the aim to keep it as neutral as possible with respect to viewer emotions. S*ee Appendix A this dissertation for a worksheet of the animation details.*

Velocity

Velocity was defined as the movement speed of the two blocks over the track. In order to keep the scene's duration constant at 20 seconds, we scaled every object in the scene (the block, the floor, the camera) except for the track, i.e. the route of the blocks, and the time. The scaling resulted in equal perceptual sizes of the blocks and perceptual differences in movement velocity. Each level (--, -, neutral, +, ++) differed a factor 1.5 with the next level.

Efficiency

Strong efficiency was defined as the most economic course of the chaser in catching the chased. The track of the chaser was varied. In a negative efficiency variation the chaser takes outside-bends, and in a positive one inside-bends corners – both in relation to the bends of the chased. See Figure 2 for an example.
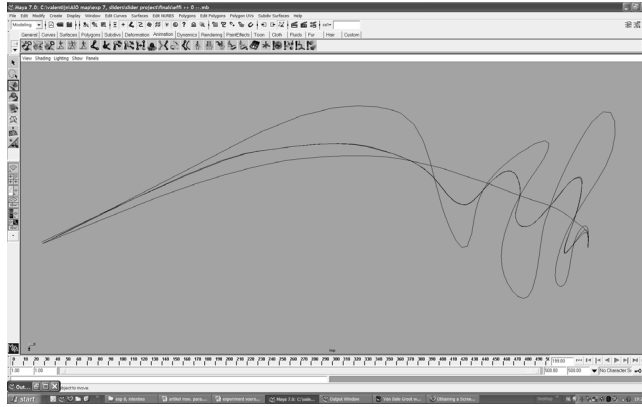
Figure 2. Efficiency Tracks.
Three of the five efficiency tracks. The extremely inefficient track (--), the neutral track (0) and the extremely efficient track.

Detail

Detail pertains to temporal density of velocity changes. By varying the number of "keys" in animation, the number of velocity alterations of the chaser was manipulated. Detail level - - has 2 keys, level –5, the neutral scene 8 , detail + 14, and detail ++ 26 keys.

Fluency

Fluency pertains to smoothness of velocity transitions at points of velocity change. The smoothest transition between two subsequent velocities (fluency ++) was achieved by a horizontal key angle while an extremely abrupt transition was made by a step-wise key angle. To increase perceptual abruptness in the fluency-condition, we inserted a 1 frame (1/25 second) pause before the chaser moves on.

In the fluency - - condition six frames (6/25 second) were inserted, resulting in a full stop of the chaser just before the velocity change.

Deformation

Deformation refers to dynamic shape alterations of the chaser object when changing its course. It was manipulated by adjusting the ratio of height to width of the object. These were exponentially scaled by one third per step, keeping depth and volume constant. Deformation is comparable to the well-known animation technique of "squash and stretch", yielding an impression of elasticity and inertia. When the ratio of height to width is negative, deformation will be large, because the object is wide – see Figure 3.
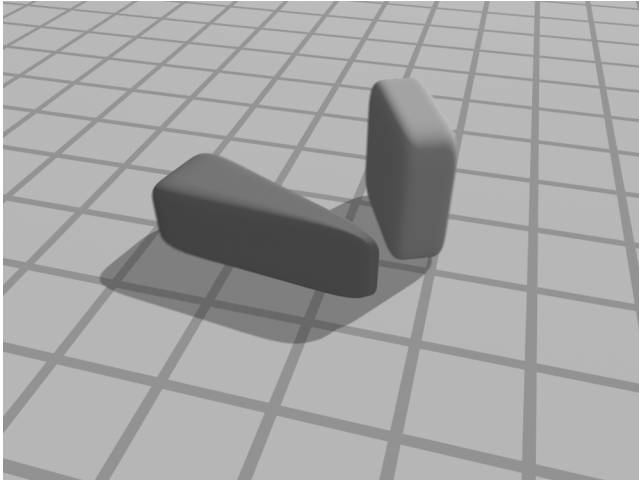
Figure 3. Example of Deformation With Proportion Level --.

Dependent Measures and Experimental Design

There are three dependent variables: genre fittingness judgment (4 levels: comic, drama, action, nonfiction), aesthetic impression (fascination, beautiful, surprising) and emotional impression (funny, sad, impressive, scary). They were measured using 5-point rating scales (1: very bad (fittingness)/ very low (fascination

etc.)– 5: very good/ very high). Genre fittingness of each scene was rated for all four genres.

The design consisted of five non-crossed independent variables, the movement parameters, each with five levels (- - , -, 0, +, ++). It should be noted that level 0, the neutral scene, is one and the same scene for all five parameters. It featured twice, bringing the total of scenes to 22. The order of the scenes was randomized. To deal with order effects between participants, two orders were created, with one the reverse of the other. All participants rated all scenes.

Procedure and Participants

Participants were tested in groups of eight. Each scene was shown twice, and then viewing was halted until all participants had filled the questionnaire. Sessions took an hour and were divided in two parts. In the first genre recognition was measured. In the second the 22 samples appeared in a different order and the aesthetic and emotional impression was measured. Fifty-seven participants joined in the study. Five were discarded because they skipped a considerable part of the questionnaire.

6.4 Results

A MANOVA analysis was carried out with all eleven dependent variables as within-subject variables in the syntax. The control variables gender and order did not have main effects on dependent variables (F = 2.27, p = 0.13; F = 0.63, p = 0.43).

Effects of Movements

An overview of the effects of the movement parameters on genre fittingness judgments, emotional and aesthetic impressions is given in Figure 4. The tested movements influenced comic genre fittingness most – in other words, the comic genre is recognized more than any other genre by specific movements. In contrast, the drama genre recognition is affected least by movement variations.

Concerning the emotional and aesthetic impressions, movements have the strongest effect on surprise impression and the weakest on the beautiful and sad impressions. *See Appendix B of this dissertation for an detailed overview of the movement prototypes and optima for each viewer impression.*
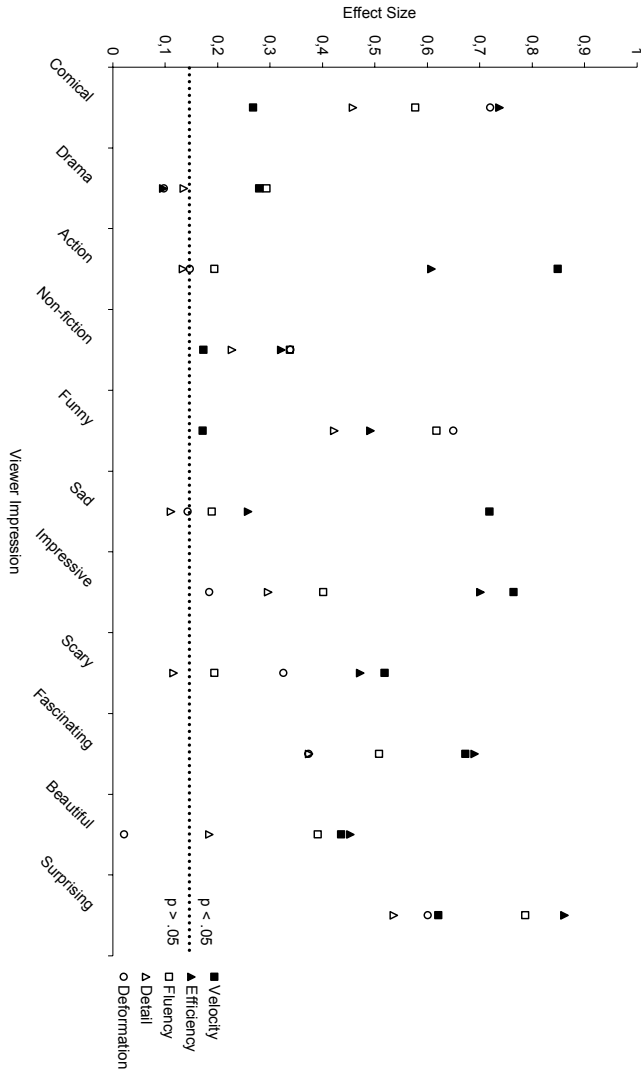
Figure 4. Effect Sizes of the Movement Parameters on Viewer Impressions. Cases above the dotted line at the bottom of the figure are significant (p < .05).
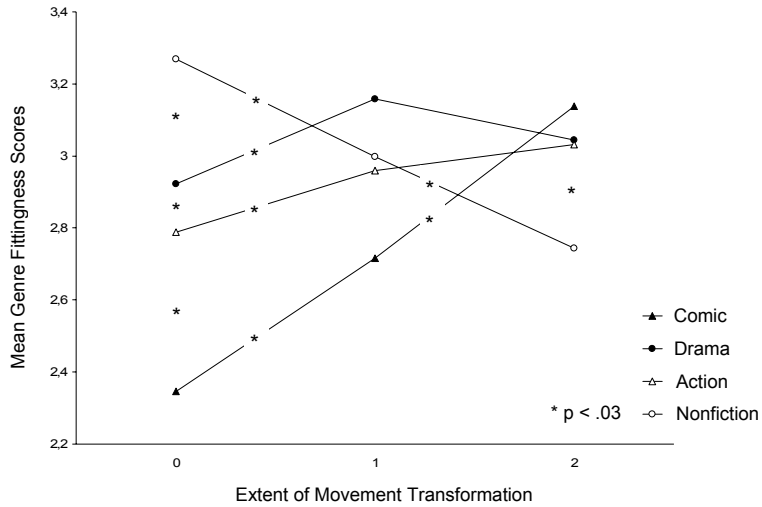
Figure 5. Effect of Movement Transformation on Genre Categorization.

Genre Classification

Figure 5 presents the effects of movement transformation on genre fittingness judgments. Data for + and - transformations were pooled per movement parameter, yielding three instead of five transformation levels, zero, 1 (= + and -) or 2 (= ++ and --). Significance is measured using a post-hoc Games Howell test. Unmanipulated movements were judged to fit significantly better in the nonfiction genre than in any other genre. Moreover, they fitted better in nonfiction than manipulated movements did. In addition, the Realism prediction is validated, while the neutral movements were judged to fit best in nonfiction, second to best in drama, second to worst in action, and worst in comic. The Transformation prediction also received support. Moderate transformation of movements improved recognition of all three fiction genres, as expected. Strong transformations only improved comic recognition. Recognition of the comic genre was affected by movement transformation in exactly the opposite direction as nonfiction recognition (r_s = - 0.31, p < .001) - see Figure 6.
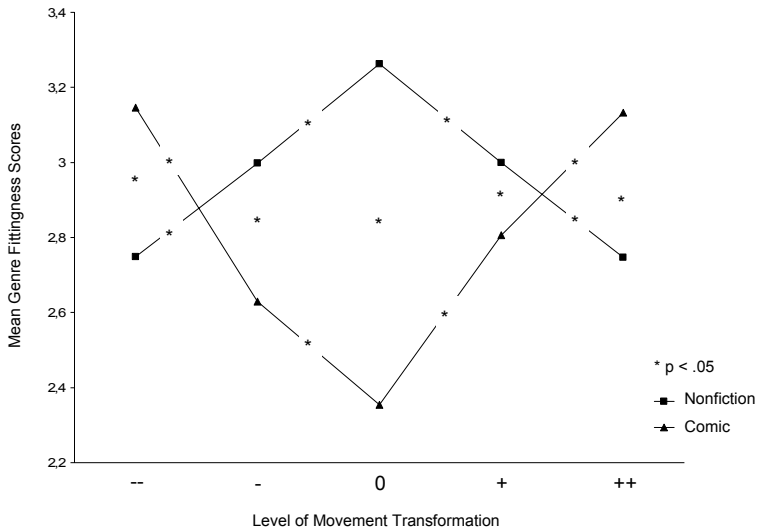
Figure 6. Effect of Movement Transformation on Nonfiction and Comic Categorization.

Correlations between Genre Recognition and Impressions

The dependent emotional impressions were selected according to typical functions of genres, so correlations were expected between genre fittingness judgments and emotion impressions. Significant correlations (p one tailed: < .001) obtained for the pairs comic genre and funny impression (r_s = .49), drama and sad (r_s = .24) and the pair action and impressive (r_s = .33). Nonfiction and scary didn't correlate significantly. Nonfiction also showed no correlations with any other emotion, except for a low negative correlation with the funny impression (rs = - .16, p < .001).

Underlying Factors

An exploratory principal component analysis was carried out on all 11 dependent variables jointly. Three components (eigenvalues > 1) explained 32%, 15% and 11% of the total variance - see Table 1.

The first component contained the action genre and the impressive-, scary-, fascinating-, surprising- and beautiful-impression. Common to these variables is excitement. The second component contained the nonfiction genre with a positive loading and the following three components with a negative loading: the comic genre, the funny- and the surprising-impression. We propose to name the underlying dimension of these variables realism. The third component contained the dramatic genre and the sad- and beauty-impression. This factor can be interpreted as sentiment, i.e. the aesthetic impression in the popular sense, reminiscent of a bitter-sweet emotion (Oliver, 2005).

	Component		
Viewer Impression	Excitement	Realism	Sentiment
Impressive	.845		
Scary	.752		
Fascinating	.738		
Surprising	.691	-.491	
Action genre	.589		
Comic genre		-.814	
Funny		-.775	
Nonfiction genre		.572	
Sad			.803
Beautiful	.565		.600
Drama genre			.538

Table 1. Factor Loadings.
The factor loading are based on principal component analysis with Oblimin rotation and Kaiser normalisation.

6.5 Discussion

Our study showed what movements elicit specific genre-, emotion- and aesthetic impressions in the viewer. The results show that viewers categorize neutral untransformed movements as nonfiction, i.e. realistic movements. These nonfiction movements were judged to have a declining fittingness score from nonfiction to drama to action to comic – in line with the Realism prediction. This finding suggests that realistic movements are associated most with the nonfiction genre, less so with drama, one but least with action and least with comedy. The Transformation prediction that is

complementary to the Realism prediction, was also validated: the size of transformations from the neutral "realistic" movements determined which particular fiction category scenes were judged to fit in: moderate deviations resulted in categorization as drama and action, large deviations in comedy. In addition, the study showed that genre categorizations are linked to specific emotion-, and aesthetic impressions. The categories seem to be organized in three underlying dimensions: excitement (action genre), realism (nonfiction and comic) and sentiment (drama). Obviously, the choice of used movement parameters used and their levels imposes limits to the general validity of results.

The results can, first, be explained by assuming a specific organization of genre knowledge. The distinction between nonfiction and fiction may be mentally represented as a deviation from realistic percepts. In line with situated simulation theory (Barsalou, 1999, 2003), people attempt to categorize genre in a film viewing situation by re-enacting or simulating their stored perceptions from reality and from films seen earlier. These simulations provide proprioceptive experiences and representations on a cognitive level that are used to make categorical inferences - for instance as to emotions (Goldman & Sripada, 2005; Barsalou, 1999) and genres. Simulations of perceptions made in the reality of daily life are most available, and percepts from the film are compared to these in the first place. Our study suggests that viewers can be expected to have specific knowledge to recognize the amount of reality deviation of their perception.

A second, additional explanation is that viewers mind-read the communicative intentions of the film-director. Regular film viewers may tacitly assume that filmmakers draw scenes from a base of nonfiction examples and transform these into scenes intended to excite, evoke sentiment or make people laugh. Recognition of the intended emotions and genre are useful to viewers because they facilitate emotional experiences (Niedenthal, Innes-Ker, & Halberstadt, 1999).

The relative contributions of categorization by simulation and of reading the film maker's intentions have to be investigated yet. This question seems of extreme importance for a most general insight into comprehension of fiction. Do viewers simulate fictional events while losing or while maintaining their awareness of the film's communicative meaning? This study indicates that viewers do

consider the reality status of their perception. When they recognize something as fiction, it would require a tiny inferential leap for them to include the communicative intentions behind the percepts. However, future studies have to address these questions starting with a more explicit distinction between dependent variables such as recognition of intentions to evoke emotion, on the one hand, and the experienced emotion, on the other.

The present research made a first attempt to a theory of how viewers' fiction and nonfiction categories are organized. Future research should overcome the present limitation to the categorization of movements, and include other components relevant for the transformation of nonfiction to fiction, such as sound, language or presented events. Neuropsychological implications of the present research also remain open to further research. The localization of neurological processing areas of perceptions categorized as fiction and nonfiction might reflect the reality deviations as well. With regard to perceptual implications, it remains to be explored if viewer categorized nonfiction and fiction perception differ in online language processing (Kaschak, et al., 2004) or eye movement (Richardson & Matlock, in press)

CHAPTER 7. GENERAL DISCUSSION

7.1 Review of the Results

7.1.1 Filmic Realisation Cues Are As Strong As Event Cues for Genre Recognition

As noted in Chapter 2, section 2.2.4, there are two main analytical cue families that are expected to affect the viewer's genre classification: event cues, involving the story and myths, and filmic realisation cues, involving all image-related cues such as colour, sound, props, camera, editing, and movements. Experiment 1, Chapter 4, was performed to test the cue strength of genre-specific event cues versus genre-specific film realisation cues. In that experiment, existing film scenes were used as stimuli. The image quality of the scenes was impoverished to avoid direct recognition of the film by the participants. Four genre prototypical events were taken, a *stumble* for comedy, a *happy reunion* for drama, a *running chase* for action and *waiting for the elevator* for nonfiction. For each of these four events, four genre prototypical filmic realisations were taken – one from each genre. For example, the stimuli set contained a happy reunion scene taken from an action film and also a running chase from a drama film. The results showed that (a) filmic realisation was the stronger cue in the viewer's genre recognition, except for drama recognition; (b) the influence of a genre-typical event on genre recognition decreased stepwise from drama to action to comic to nonfiction. These conclusions validated in general the second hypothesis stating that the filmic realisation cues, including movements, are stronger than event cues in their effect on genre classification. The validation of this second hypothesis suggests that viewers do possess a specific knowledge of visual simulators that, in most cases, is dominant over knowledge of event simulators, at least

in a task requiring classification of film fragments lasting up to 24 seconds.

The main limitation of this study is the fuzzy border between any filmed event and its filmic realisation. Like any analytical distinction between form and content, the two cannot function independently and will sometimes overlap. Events can be part of a filmic realisation: for example, a stumbling event may be a comic event in itself, but may also be part of a strong comic filmic realisation of another event, such as a happy reunion. Nonetheless, the theoretical problem of the forced separation of the event and filmic realisation still allows a practical analysis of the effects on viewers of either one of them – as is shown in the full-factorial Experiment 1. In this experiment filmic realisation and event were varied independently. However, the variation here did not consist of a manipulation, but of a selection, leaving the definition of the independent variable implicit.

Another limitation is the definition of the filmic realisation. In the experiment, the surface definition was used, referring to surface characteristics of the film (cf. Bordwell's definition in Chapter 2, section 2.2.4). Movement cues tested in Experiments 2 and 3 are only one of these surface characteristics, among many others including camera and sound handling, editing, and the like. Although attempts were made in all three experiments to foreground movements by suppressing the effects of other parameters such as genre-typical faces, colour and sound patterns (Experiments 1 and 2), and by controlling for differences between stimulus fragments with regard to camera handling and editing, the influence of parameters of filmic realisations other than movement might still exist. For instance, although in Experiment 3 all other filmic realisation cues, such as camera handling and colours, were kept constant, their effect as a constant factor may have influenced the viewer's impression on the whole. The same kind of effect may hold true for the chosen event in Experiment 3, i.e. the chase. Future animation experiments using the same movement variables, but varying the filmic realisation cues and events, could be used to test the supposed generality of the found effects of movement cues.

7.1.2 Character Movements Cue Genre Recognition

According to the first hypothesis (Chapter 1, section 3.2) tested in this research, movements act as a cue for film genre recognition. Experiment 1 showed that movement cues, as part of filmic realisation cues, can be expected to have cue validity. Whereas Experiment 2 provided partial support for the first hypothesis, Experiment 3 yielded complete support for it. In Experiment 2 'Happy reunion' film scenes were taken from comic, action, drama and nonfiction films. Their speed was varied as to result in three levels: original velocity, acceleration by one third, and deceleration by one third. Velocity proved to be an effective parameter in the recognition of the comic and drama genre, but not of the action and nonfiction genres (see Figure 2, Chapter 5, section 5.4): acceleration of a scene led to a significant increase of the comical genre fittingness, while deceleration led to a decrease of the comical genre fittingness and an increase of the dramatic genre fittingness. In this experiment on film speed, however, the movement variation was embedded in the velocity variation of the scene as a whole. Although the acceleration/deceleration of one third was not noticed by most of the viewers, they were cued by it in their genre classification. More technically speaking, an experimental confounding of the independent variable with uncontrolled other variables is responsible for the obtained effects. Experiment 3 was performed to test whether object velocity and other object movements separately affected genre recognition. In this experiment computer animations of two abstract blocks chasing each other served as stimuli. In the animations, the movements of the chaser block were varied on five movement parameters: velocity, efficiency, fluency, detail and deformation. For each of the five parameters, animations were created with the following five levels (--, -, 0, +, ++). Viewers were asked to rate the genre fittingness of each scene (in comic, drama, action, nonfiction), the aesthetic impression (fascination, beautiful, surprising) and emotional impression (funny, sad, impressive, scary). Results showed that all of these dependent variables were influenced by specific movements. Moreover, the data allowed for an exploration of which specific movements were judged to be prototypical and optimal for various genres and for a number of genre-related viewer emotions (see Table 1 in Appendix B for an overview). The analysis also

warrants a more general conclusion, namely that genre classification is highly dependent on presented movements, validating the first hypothesis. In addition, Experiment 3 shows that the viewer's genre impressions are closely bound to specific emotion and aesthetic impressions. The four genre categories appeared to be organized in three underlying affective dimensions: excitement (action genre; impressive; scary; surprising; fascinating; beautiful), realism (nonfiction genre (+ value); comic genre (-); funny (-); surprising (-)) and sentiment (drama genre; sad; beautiful). The validation of hypothesis 1 suggests that viewers possess implicit visual genre knowledge that is accurately used in genre and emotional classification tasks.

It should be noted that Experiments 2 and 3 did not vary body movements in the strict sense, but first started by varying film velocity, including body movements (Experiment 2), followed by variation of locomotion movements (Experiment 3). In Chapter 2, section 2.4 on the choice of movement parameters, I explained reasons why object locomotion was varied rather than body motion in a more limited sense. The variation of specific body movements and its effect on genre recognition is therefore a logical next step to be taken in future experiments. The advantage of locomotion movements is that they are not limited to the human body but will probably have the same kind of effect when applied to animals, animated characters, abstract objects, or perhaps even digital interface objects such as texts. Another drawback to Experiment 3 is that the number of movement parameters is limited for experimental reasons – see section 2.4 regarding the motivation for the selected parameter set. The five movement parameters under study were not truly independent: in one way or another they were all affected by velocity. Moreover, the parameters were not varied in a full-factorial design but were varied separately, with the obvious limitations to the study of interaction effects between the parameters. However, the advantage is that a statistically powerful within-subject model could be used, that would be impossible when using a full-factorial design. In that case, too many stimulus fragments would be needed for a within-subject, i.e. a repeated measures model. Meanwhile a follow-up experiment is conducted currently in which the parameters are varied in combination, by simultaneously setting sliders for each of the parameters.

Another limitation to the project is the use of questionnaires with fixed categories: participants were obliged to make a choice and think consciously about the genre fittingness of the stimuli in an off-line mode of perception. On-line measures of genre categorisation are needed to corroborate the results of the off-line tests reported here. Choice reaction times or on-line similarity ratings might be appropriate measures. In addition, the experiments did not check for cultural and historical differences between the genres. In the worst scenario, the results presented here are only valid for this particular year in Holland. However, because the chosen set of genres form a historically stable basic set without major changes since Aristotle, the results are not expected to depend greatly on historical change. Differences in genre recognition between various cultural groups might occur; however, such cultural differences are unlikely to radically change the results, in view of the choice of the four basic genres. As shown in Chapter 2, the four genres intend to call forth basic emotions (happiness, sadness, and anger/fear) that tend to be recognized across different cultures (cf. Ekman, 1989).

7.1.3 Fiction Movements Are Perceived as Transformations of Nonfiction Movements

Hypothesis 3 concentrates on the regular viewer's knowledge of genre relations, and especially the relation between fiction and nonfiction genres. It was predicted that fiction movements are perceived as transformations of nonfiction movements. This general prediction was tested in all three experiments. Experiment 2 showed that nonfiction scenes were judged to fit better in a fiction genre than fiction scenes fitted in nonfiction genres. To use a metaphor: nonfiction exports its scenes more to fiction than it imports fiction, and the reverse holds true for fiction that imports from nonfiction more than it exports to nonfiction. In Experiment 1 the same pattern was found, but the distinction between filmic events and realisation allowed for a differentiation. Asymmetrical import-export relations between nonfiction and fiction were demonstrated for filmic realisation but not for event: nonfiction only exported its filmic realisation. Experiment 3 revealed one possible cause of the export potential of nonfiction: neutral movements were recognized as

prototypical for nonfiction. Moreover, it was shown that the size of the deviations from the neutral movements determined in what particular fiction category scenes were judged to fit: small and moderate deviations resulted in categorisation as drama and action, whereas large deviations resulted in categorisation as comedy. The validation of this third hypothesis suggests that the distinction between fiction and nonfiction categorisation is mentally represented as a deviation from realistic simulators. These deviations are interpreted as transformations of realistic nonfiction precepts specific for each fictional genre.

An obvious limitation to the generality of these findings is the extent of the set of movement transformations. In Experiment 2, three degrees of velocity transformations were created which were intended to remain unnoticed by the viewer – hence the acceleration or deceleration steps of one third each. Experiment 3 allowed for a greater extent of transformations: each movement parameter had five levels; the extreme levels, 1 and 5, were chosen with the aim to be perceived as extreme by the viewer. All levels differ exponentially in order to keep perceptual differences between levels constant according to the Weber-Fechner law. Still, the effect of the movement cues found can not be generalised beyond the extent of transformations used, or beyond the choice of the movement parameters. To increase support for the suggested organisation of genre knowledge, additional studies are needed which vary other filmic realisation cues, such as camera handling, as well as the nature of events.

Particularly this latter topic deserves further study, because fictional events may be perceived and categorised by their deviations from nonfiction events, just as fictional realisations are by their deviations from nonfiction realisations. Neurological imaging studies may also add further support. Such studies might demonstrate how fiction is processed on-line, how processing of fiction differs from nonfiction, and to what degree identical brain areas are active in fiction and nonfiction processing. My hypothesis is that fiction processing will be associated with a higher activity of brain areas specialised in processing nonfiction, than nonfiction processing will be associated with activity in areas specialised in fiction processing. Summarizing, the present research found indications for the organisation of viewer genre knowledge only by analysing

questionnaire output. How the viewer uses this knowledge in his on-line processing of genres needs further study.

7.2 Theoretical Implications for Genre Knowledge

7.2.1 Cognitive Representation of Genre

The main hypothesis of this dissertation is that viewers possess implicit and detailed knowledge of genres. This knowledge was shown to correspond to expert notions of genre, in use by professional critics and scholars, and more or less canonised in the theory and history of genre (see Chapter 2). Regular but untrained film viewers, thus, share these notions to some extent, at least in a way that enables them to recognize the basic genres. Although none of the participants was informed about genre definitions before the experiments, they all knew exactly how to apply the genre categories. Average viewers were able to accurately categorise film fragments into the correct genres, even when the visual quality of the fragments was severely impoverished, as in Experiments 1 and 2 (see especially Table 1 in Chapter 4, section 4.4). It therefore seems that genres are more stable and more subject to common knowledge than some genre theoreticians suggest (cf. Altman, 1999; Neale, 2000). This shared or common knowledge of genres can be traced back to the mythological origin of genres, because myths are also a widespread system of hereditary stories (Abrams, 1993). The cue validity of the filmic realisations for genre recognition suggests that the expression of mythical stories has been realized in roughly the same manner throughout history. However, careful historical research is needed to establish whether the claim can be justified that myths consist not only of historical stable events, but also of historical stable realisations.

The studies reported have shown that the ordinary viewer's knowledge with regard to representation formats is remarkably complex. It is extremely probable that viewers recognise genres by their typical surface structure; this requires a detailed and embodied representation of typical examples. As to detail, relatively small variations in velocity, which were not consciously observed by the participants, had a significant effect on their genre classification. The

findings of all three empirical studies suggest that filmic realisations, and especially movement cues, function as simulators in genre categorisation. The use of transformational distance as a cue in (fiction) genre classification, supported by the experiments, requires a more abstract categorisation system. As we have seen, Barsalou's (1999) account of abstraction processes, starting from perceptual simulations, links the two representation formats, i.e. filmic realisation knowledge and transformational distance. As Barsalou (1999, p.585) notes, simulators may contain transformed percepts. This allows for the possibility that fiction simulators are built upon nonfiction percepts. Nonfiction and fiction simulators are probably also part of shared knowledge of film directors and their audience, facilitating their communication and the viewer's recognition of the genre that the director intended. It is conceivable then, that ordinary viewers can recognise a genre in a fairly automated fashion within a short presentation time, and also reason about genre fittingness, not unlike what film experts do. Future research should test whether untrained viewers can perform counterfactual reasoning by generating (both correct and) non-fitting examples. The sophistication of the genre knowledge system is also striking when we take into consideration that it deals with transformations, that is, higher order characteristics of filmic realisations, a hypothesis that received considerable support in my studies. Moreover, the experiments showed that the basic genres are not separate mental categories but are precisely organised as to their deviation from nonfiction.

All these elements of knowledge can be available to ordinary viewers, while at the same time, being non-experts, they are not good at articulating rules and labels in any explicit verbal way. The lack of explicit rules and labels can be explained in two ways. First, it reflects the way regular viewers have acquired genre knowledge, namely by learning from example, which is by accumulating perceptual simulators while viewing, rather than by explicit instruction in genre theory. Regular film viewers learn by doing, that is, by watching examples and building up self-organising networks of simulators. Accumulation starts with the perceptual experience of reality, followed by nonfiction representations of reality, abundant in today's media supply, to which are added examples of fiction. Second, categorisation in regular film viewing has an aim. It does not take place in the service of classification per se, but in its on-line form

serves the generation of expectations on a narrative, image, and emotional level, allowing for higher interest and enjoyment of films.

7.2.2. Genre Knowledge and Emotion

If regular film viewers' knowledge of genre corresponds to expert notions, then it is plausible that they have strong intuitions about emotion profiles of genres, that is, the potential of any genre to elicit typical emotions. This was a background assumption in the research addressed in Experiment 3; the results showed that the comic genre was rated as more funny, drama as more sad, and action as more impressive, and are in line with genre theory.

The assumption was not tested further in this project, but anticipating additional support, it adds to the picture of a complex genre knowledge that regular viewers share with (genre) experts. Three conceptual structures may be pivotal in genre knowledge, namely prototypical filmic events, filmic realisations and emotions or emotion profiles (including aesthetic experience). As stated in Chapter 2, knowledge of events, filmic realisation and emotions may be integrated in perceptual simulations of genre-typical examples. If this is an accurate portrayal of implicit genre knowledge of the viewer, then it is surprising that nonfiction did not correlate positively with any of the emotions - except for a negative correlation with funniness and surprise, reflecting the idea that the nonfiction genre is serious in the first place. This result seems strange because nonfiction is the only genre capable of having direct consequences for the viewer's daily life. Two reasons might explain this finding. First, fiction emotions may be more discrete than nonfiction emotions. As argued in discussing the theory of genre (Chapter 2), the three fiction genres can be easily differentiated according to specific characteristic and discrete emotions. In contrast, nonfiction, in its pursuit to capture a relatively undirected and unmanipulated reality, has a more diffuse emotional profile. There is neither a single, nor a single strongest emotion provoked by reality. Emotions provoked by nonfiction depend on the choice of reality events that are presented, and that choice varies immensely among nonfiction films. Because of this emotional heterogeneity people seem to regard nonfiction representations as eliciting less intense emotions than fiction. The second reason for the

non-specificity of emotions associated with nonfiction may be due to the different processes of emotion elicitation by fiction and nonfiction. Emotions in fiction film may be driven less by event-appraisal processes and more by empathy or motor mimicry processes (cf. emotions in music: Scherer & Zentner, 2001; see also Tan (1996) for empathic emotion in viewers of fiction film). Empathy is one of the main communicative purposes of fiction film, while nonfiction has the persuasive argument as its main communicative purpose (Nichols, 2001). Moreover, acting of characters in fiction film is often much more streamlined as to expression of a single emotion than the uncertain and mixed acting in nonfiction (e.g. Tan, 2005). Perhaps this unrealistic and exaggerated expressive acting in fiction results in a stronger emotional "contagion" (Scherer & Zentner, 2001), involving motor mimicry, of the viewer than the realistic and more complex expressive acting of nonfiction does. Future studies will have to specify this difference in emotional contagion between realistic complex expressive movement on the one hand and unrealistic simplified movements on the other.

Despite the lack of expression and viewer emotion enhancing in nonfiction, in comparison with fiction, there are sound theoretical reasons for predicting stronger emotions in viewing nonfiction, due to the appraisal processes it cues. The strength of emotions depends on the relevance of the events for the person's concerns. According to Scherer (2001, p. 94), a first stimulus evaluation check carried out by an organism faced with an object or event is a quest for its relevance: "how relevant is this object or event for me. Does it directly affect me or my social reference group?" Nonfiction would theoretically be the genre that is most relevant to the concerns of the viewer and will therefore induce a strong appraisal leading to an emotional response (Scherer, 2005). An explanation for the relative lack of emotion correlations with nonfiction obtained in Experiment 3, is that the relevance of nonfiction was much less apparent in this study than in real-life experience of nonfiction scenes. Participants were able to classify a scene as nonfiction, but they did not find the scene relevant for their daily life. Future experiments using specific nonfiction scenes that signal a high relevance to the viewers, such as the 9/11 attack, might show that nonfiction can induce more intense emotions than fiction.

7.3 Future Research

The present research is among the first empirical studies on genre recognition and the nature of genre knowledge. The results of the studies proved to be stimulating and of importance for genre theory and for the theory of knowledge organization of fiction and nonfiction genres. In particular, the results contribute to an understanding of the effect of movements on genre and emotional viewer impressions, and offer comparative insights into the effects of filmic event and filmic realisation on genre classification. In the face of the growing role of moving images in society and culture, future research along these lines seems to be promising and of theoretical as well as of practical importance. Performing research into processes underlying genre recognition involving various cues, including actor movements, is greatly facilitated nowadays thanks to the recent rise of neuroimaging studies, perceptual simulation theory, and digital animation techniques. The present dissertation has made me, at least, enthusiastic to continue research topics that address the remaining questions, such as will be outlined below.

7.3.1 Filmic Realisation Cues

The present research showed that viewers are strongly cued by actor movements in the process of genre categorisation. One limitation is that only a small set of filmic realisation cues is studied independently. Additional experiments on the effects of elements of filmic realisation, such as sound, camera, editing, speech and colour, on genre categorisation will provide more insight into regular viewers' media perception and the cue validity of filmic realisations. Such empirical studies will add to the analytic knowledge embedded in film theory (e.g. Bordwell & Thompson, 2004), or will take this knowledge as a starting point in order to explore its reality in untrained viewers.

Two experiments have already been carried out but remain to be finalised and publicised. The first is an experiment using an interactive application presenting an animated chase movie. Four movement parameters (velocity, efficiency, fluency, and deformation) can be manipulated by the user. He or she controls four virtual sliders

programmed to affect in real-time the movements in the presented animated chase. The programming of the sliders has been performed in collaboration with Daniël Saakes of Studiolab at the Technical University Delft. See Figure 1 for an example of the sliders.
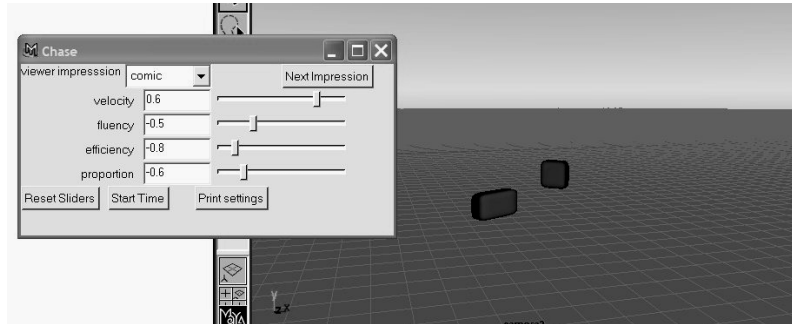
Figure 1. An example of interactive sliders.

The advances offered by the sliders in comparison to the animations used in Experiment 3 include:

1. Combinations of movement parameters can be made. For example, an animation can be created in which the movements of the chaser have low velocity and efficiency combined with high fluency and deformation.
2. The levels of the sliders are manifold and fine-grained, encompassing 21 different settings each, whereas only five levels of the movement parameters were used in Experiment 3.
3. Besides measuring the effect of movements on the viewer's impression, the viewers can also be asked to produce expressive movements. In other words, the match between e.g. a producer's expression and a viewer's impression (intended by the producer) can be established using one and the same tool. For instance, an experiment will be set up asking professional animators to configure the sliders to specific genres, emotions and aesthetics. Subsequently, it will be tested to what extent these impression-specific

134

intended configurations correspond with the viewer's impressions by presenting them to naïve viewers.

The second, partly finalised, experiment on filmic realisation cues involves a variation of the presentation medium. This experiment uses the same set of dependent variables as in Experiment 3 (4 genre impressions, 3 aesthetic impressions, and 4 emotion impressions) and the same stimuli of the animated chases using the 5 movement parameters varied independently on 5 levels. A novelty is the introduction of the representation variable. Three conditions were added to the presentation in Experiment 3 which originally consisted of 2D projection on a screen covering an area of approximately 2 x 1.5 metres: (a) 2D projection of the animation on a screen covering an entire wall (approximately 3 x 4 metres), (b) 3D projection covering an entire wall; and (c) 3D projection covering four walls (floor, side walls, and back walls). The experiment was run in a virtual reality theatre, the CAVE at the University of Amsterdam's computer centre SARA in Amsterdam – see Figure 2.
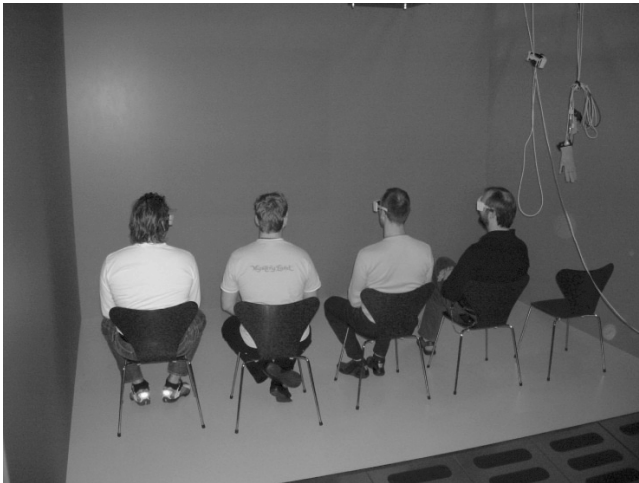
Figure 2. Setting of the CAVE experiment.

Results of the experiment provide insight into the effect of 2D versus 3D presentation on the viewer's emotive and aesthetic

impression and on his genre classification. It is expected that the emotional intensity and differentiation will increase with the presentation's degree of bodily immersiveness, with the CAVE 3D four wall projection gaining the highest degree of immersiveness. Genre classification results of Experiment 3 are expected to be replicated, but an overall decrease of the general recognition level is also expected as the familiarity of the presentation medium decreases.

7.3.2 Filmic Realisations and Events

Experiment 1 showed that viewers were guided more by filmic realisation cues than by event cues in their genre recognition, except for drama. However, it seems probable that event cues may gain validity over time, eventually outperforming filmic realisation. An experiment presenting informants with longer events than those used in the experiment (that ranged from 8 to 24 seconds), might boost the event cue's validity. Moreover, an interesting possibility is to identify the point in time at which the event cue dominates the filmic realisation cue for each of the four genres, by stepwise lengthening of the fragments.

Another experiment of interest is that in which the nonfiction scenes' relevance to the viewer is varied. This might increase the event cue validity as well as the emotional effect of nonfiction scenes.

Finally, from a practical point of view it would be interesting to assess the effect of movement cues with different events. This would require an extension of the slider experiment described above. In addition, data from the slider experiment could be completely parameterized, and applied to any animated character or moving robot. In the case of robots, genre recognition will probably decrease, because the presented genre categories may appear inappropriate for the behaviour of a real object, but the intensity of accompanying emotions might increase.

7.3.3 Object-Independent Expressive Movements

If we widen our scope of interest from genre recognition to emotional experience in a very broad sense, a final remaining and fascinating question looms, which is if specific movements *per se* affect viewers. Do movements that are cut-off from any recognisable event, and even isolated from any object performing or being subject to it, incite feelings and affective experiences? In fact we are dealing here with abstract movement. To explore this issue, I have received a grant from NWO, the Netherlands Science Foundation, allowing me to perform a number of studies in the coming two years with the Geneva Emotion Research Group, led by Klaus Scherer. In the project it will be tested how emotional and aesthetic appraisals of visually projected expressive movements are influenced by the degree of abstraction of the object that performs the movements. It is hypothesized that the emotional response to perceiving typical expressive movements, e.g. swarming, is invariant to the degree of abstraction of the object that moves. More specifically, I will try to demonstrate that movement Gestalts exists that are appraised in an emotion-specific manner, involving the viewer's proprioception. The viewer's emotional responses will be measured using questionnaires and physiological data.

SUMMARY

This dissertation presents three experimental studies on film genre categorisation based on genre theory and cognitive categorisation theory. In short, the experiments presented demonstrate that regular viewers can easily be cued by specific movements to form specific genre and emotion impressions. The cue validity of filmic realisation cues was shown to be at least as strong as event cues. Moreover, the experiments show that viewers possess very detailed genre knowledge that they use to classify and differentiate between four basic genres: nonfiction, comedy, drama and action. The results also indicate that the viewer's knowledge of fiction genres is organized according to their specific deviation from realistic nonfiction genre knowledge. The following summary briefly addresses Chapters 1 through 7.

Introduction and Theoretical Context: Genre and Genre Recognition: - Chapters 1 and 2

Categorisation of sensory data is of fundamental importance in order to understand events in the world that we are dealing with. Categorisation enables us to understand our perception by connecting the incoming sensory data to meanings and memories. Categorisation is indispensable for the formation of inferences and expectations, and for the planning of future actions. For instance, when seeing a dog running towards you, the object is categorised as a running dog that might play or bite, which forms the basis for deciding on actions like running away or playing. In media perception, and especially in film and television viewing, the main categorisation people make is as to which genre the production belongs: for instance, is it a nonfiction production that may have consequences for our daily life, such as weather reports or starting wars, or is it a favourite fiction genre? As is noted Chapter 2, the theoretical introduction, genre classification has a number of functions in film viewing, including priming the

viewer's interest, affecting his viewing style, arousing emotional moods, and generating narrative and emotional expectations.

Although genre classification is fundamental for the perception of film and television, there is surprisingly little research on how viewers arrive at genre categorisations. In most cases the genre category to which a film belongs is known beforehand, by information from friends, critics, program guides, the production's title, or by knowledge about its director. However, in some situations such as channel zapping the viewer has to rely on genre cues provided by the current film sequence. Moreover, it seems likely that even when watching an already classified genre film, viewers continuously rely on film cues to check the genre status and to adjust and refine their categorisations. The present dissertation examines what filmic features cue the viewer to a specific genre categorisation and how the viewer's genre knowledge is organised.

In instant classification tasks, many cues are expected to affect the viewer's genre recognition. Among these are: camera handling, sound, editing, actors, dialogue, plots, settings and props. These and other cues can be divided into two main cue families: cues belonging to the presented event, and cues belonging to the filmic realisation of that event. In other words, cues that reside in the story and cues that reside in the image. As discussed in Chapter 2, classical genre theory usually discriminates genres according to typicality of events. This is due to the reliance of genres on mythological stories: e.g. happy reunions are considered to be typical for the drama genre, whereas chases are considered to be typical for the action genre. However, similar events are often presented in each genre by very different specific filmic realisations. An informal analysis of such genre typical filmic realisation differences of a chase is presented in Chapter 1. Differences were found, amongst others, in setting, body movements and camera handling. These differences add to each genre a specific character, and it seems plausible that they are used by the viewer for genre recognition purposes, just as genre-typical events are. Recent developments in cognition theory render the cue validity of such surface characteristics even more theoretically plausible, as is argued in Chapter 2. Simulation theory (Barsalou, 1999) in particular grounds conceptual and categorical knowledge in perception and thus increases the validity of surface cues for genre categorisation and our understanding of the world in general.

This dissertation tested the cue validity for genre recognition of a specific group of filmic realisation cues: actor movements. Testing the effects of movements on genre recognition not only provides insight into the different movement cues for each genre impression, but also addresses more general questions about the existence and organisation of the viewer's genre knowledge (see also Chapter 1, section 1.2).

The Experiments – Chapter 3

Testing of genre cues was performed in three experiments, each of them using between 44 and 70 participants, reported in Chapters 4 to 6. In the first experiment, the effect of filmic realisation cues versus event cues on the viewer's genre recognition was tested. The second experiment aimed at testing the genre classification effect of one particular filmic realisation cue: movement. Velocity was chosen as the parameter of movement to be tested first. Subsequently, the third experiment tested the cueing effect of velocity and an additional set of four specific movement parameters on the viewer's genre, aesthetic, and emotion impression. The rationale behind the choice of these five movement parameters can be found in Chapter 3, section 3.1.

Filmic Realisation Cues versus Event Cues – Chapter 4

This experiment tested whether genre typical filmic realisation cues of a filmic scene are as strong as event cues in their effect on the viewer genre classification of that scene. In this experiment, existing film scenes were used as stimuli. Image quality was impoverished to prevent direct recognition of the original films. Four genre prototypical events were taken, a *stumble* for comedy, a *happy reunion* for drama, a *running chase* for action and *waiting for the elevator* for nonfiction. For each of these four events, eight genre prototypical filmic realisations were taken – two from each genre. For example, the stimuli set contained a happy reunion scene taken from an action film (i.e. a typical drama event in an action realisation) and also a running chase from a drama film (i.e. a typical action event in a drama realisation). The results showed that (a) filmic realisation was the stronger cue in viewer's genre recognition, except for drama recognition; (b) the influence of a genre-typical event on genre recognition decreased stepwise from drama to action to comic to

141

nonfiction - see Figure 2, Chapter 4, section 4.4. In other words, (a) people are influenced in their genre categorisation as much by image cues as by story cues; (b) a typical story is most important for drama recognition, than for action, than for comic, and nonfiction is recognized less by a typical story (reality varies most in its events). The results of this experiment suggest that viewers do possess a specific knowledge embodied in visual simulators that, in most cases, is dominant over knowledge embodied in event simulators, at least in a task requiring classification of film fragments lasting up to 24 seconds.

Velocity Cues – Chapter 5

Having demonstrated that filmic realisation cues affect the viewer's genre classification I then tested whether movement cues, as a group of cues singled out of the larger set of filmic realisation cues, affect genre classification. There are numerous potential movement parameters that may be candidates to test. However, to test if movements do have the expected cue validity, I tested the effect of the parameter *velocity.* If it could be demonstrated that velocity, as the parent of all movements, affects the viewer's genre classification, more detailed experiments on other movement parameters could follow. In this experiment 'Happy reunion' film scenes were taken from comic, action, drama and nonfiction films. Their projection speed was varied at three levels: original velocity, acceleration by one third, and deceleration by one third. Velocity proved to be an effective parameter in the recognition of the comical and dramatic genre, but not of the action and nonfiction genres (see Figure 2, Chapter 5, section 5.4): acceleration of a scene led to a significant increase of the comical genre fittingness, whereas deceleration led to a decrease of the comical genre fittingness and an increase of the dramatic genre fittingness.

Effects of four more movement parameters – Chapter 6

In the previous experiment the velocity of a movement was manipulated indirectly by varying the film speed of a scene. As a consequence, movement variation was confounded with the velocity variation of the scene as a whole. To test if the object's velocity, as well as other movement parameters, contributes independently to genre recognition, a more detailed experiment was performed. In this

experiment computer animations of two abstract blocks involved in a chase served as stimuli. In the animations, the movements of the chaser block were varied in five parameters: velocity, efficiency, fluency, detail and deformation. For each of the five parameters, separate animations were created with the following five levels (--, -, 0, +, ++). Viewers were asked to rate the genre fittingness of each scene (in comic, drama, action, nonfiction), the aesthetic impression (fascination, beautiful, surprising) and the emotional impression (funny, sad, impressive, scary). Results showed that all of these dependent variables were influenced by specific movements. Moreover, the data showed which specific movements were judged to be prototypical and optimal for a specific genre, emotion and aesthetic viewer impression (see Table 1 in Appendix B for an overview). In addition, it was shown that the viewer's genre impressions are closely bound to specific emotion and aesthetic impressions. The four genre categories appeared to be organized in three underlying affective dimensions: *excitement* (containing the action genre and the following impressions: scary, surprising, impressive, fascinating and beautiful), *realism* (nonfiction genre (having positive loading), the comic genre (-), funny (-) and surprising (-)), and *sentiment* (drama genre; sad; beautiful).

General Discussion – Chapter 7

In this chapter the findings of the experiments are integrated within the genre and cognitive theoretical framework presented in Chapter 2. Concerning the organisation of genre knowledge, it was predicted that fiction movements are perceived as transformations of nonfiction movements. Experiment 2 (Chapter 5) showed that nonfiction scenes were judged to fit better in a fiction genre than fiction scenes fitted in nonfiction genres; i.e. nonfiction can export its scenes better to fiction than it can import fiction scenes. Experiment 1 (Chapter 4) showed this asymmetrical import-export relation between nonfiction and fiction for filmic realisation but not for event: nonfiction exported its filmic realisation to fiction but not its events. Experiment 3 (Chapter 6) revealed one possible cause of the export potential of nonfiction: neutral movements were recognized as prototypical for nonfiction. Moreover, Experiment 3 showed that the size of the deviations from neutral movements determined in what particular fiction category the scenes were judged to fit: small and

moderate deviations resulted in categorisation as drama and action, large deviations in categorisation as comedy – see Figure 5, Chapter 6, section 6.4. The results of all three experiments suggest that the distinction between fiction and nonfiction genres is mentally represented as a deviation from realistic simulators.

All experiments showed that regular viewers do possess a very detailed knowledge of genres. Their knowledge was shown to correspond to expert notions of genre, in use by professional critics and scholars, and as more or less canonised in the theory and history of genre (see Chapter 2). Although none of the participants were informed about genre definitions before an experiment, all of them knew exactly how to apply the genre categories. Average viewers were shown to accurately categorise film fragments into the correct genres, even when the visual quality of the fragments was severely impoverished and presentation times were short (see Table 1, Chapter 4, section 4.4). The sophistication of the genre knowledge system is striking when taking into consideration that it deals with transformations, that is, higher order characteristics of filmic realisations. Moreover, the experiments showed that the basic genres are not separate mental categories but are precisely organised as to their deviation from nonfiction.

As noted in the Discussion, Chapter 7, a number of questions remain for future study. The first is whether the found organisation of the viewer's genre knowledge can also be measured in online experiments. A second question concerns the generality of the findings: (a) are the found genre and emotional effects of movement cues indeed invariant to the nature of the event? and (b) are the found effects of movements invariant to the particular nature of the object that performs them? Research to this latter question is enabled by an NWO grant allowing me to perform a number of studies in the next two years with the Geneva Emotion Research Group led by Klaus Scherer. The project will test how emotional and aesthetic viewer impressions of expressive movements are influenced by the degree of abstraction of the object that performs the movements. It is hypothesized that the emotional response to perceiving typical expressive movements, e.g. swarming or bouncing, is invariant to the degree of abstraction of the object that moves.

The results of this dissertation are applicable to both genre theory and to cognitive psychology. On the one hand, this work

presents one of the first empirical findings in the traditionally theoretical and historical domain of genre, and film studies. On the other hand, these studies are one of the first to introduce a cultural and artistic subject, like genre, into recent cognitive psychology. Apart from contributing to theory, the findings may also stimulate practical applications, such as the production of animations, films and commercials, improvement of media literacy, and the results may inspire the design of products that involve movements, such as digital interfaces, robots, toys or playgrounds. In general, this dissertation presents raw empirically-based insights into the underlying processes of our appreciation of the complex phenomenon of film and fiction. It is a start that hopefully will be extended and elaborated upon in the future.

SAMENVATTING

KIJKEN NAAR GENRES
het effect van bewegingen van filmkarakters
op genre herkenning

       In dit proefschrift worden drie empirische experimenten gepresenteerd die onderzoeken hoe filmkijkers in hun genre categorisatie van een fragment beïnvloed worden door waargenomen bewegingen. De theoretische context van dit proefschrift is tweeledig: genre theorie aan de ene, en cognitieve categorisatietheorie aan de andere kant. Samengevat heeft dit proefschrift aangetoond dat gemiddelde kijkers sterk beïnvloed worden in hun genre categorisatie door waargenomen bewegingscues. Daarbij is aangetoond dat de validiteit van beeldcues, i.e. filmische realisatie cues, zeker zo sterk is als die van verhaalcues, i.e. event cues. Bovendien blijken kijkers over zeer gedetailleerde, impliciete, genre kennis te beschikken die zij gebruiken in categorisatie taken en om onderscheid te maken tussen de vier basis genres: non-fictie, komedie, actie, en drama. De resultaten suggereren tenslotte dat de kennis van fictie genres bij de kijker georganiseerd is als een specifieke afwijking van de kennis van non-fictie genres. De nu volgende samenvatting doorloopt kort de zeven hoofdstukken.

Introductie en Theoretische Context: Genre en Genre Herkenning: Hoofdstuk 1 en 2

       Om gebeurtenissen in de wereld te kunnen begrijpen is het essentieel om onze waarnemingen te categoriseren. Categorisatie zorgt ervoor dat de binnenkomende sensorische data worden verbonden met betekenissen en herinneringen. Categorisatie is dan ook onmisbaar voor de het maken van conclusies en verwachtingen, en voor het voorbereiden van toekomstige handelingen. Een voorbeeld: wanneer je een hond op je af ziet rennen, categoriseer je dat waargenomen object als een hond waarvan je weet dat hij kan

bijten en spelen. Wat de hond zal doen, bijten of spelen, zul je uit verschillende cues proberen af te leiden – de categorisatie wordt zo verfijnd. Het resultaat van deze afleiding vormt op zijn beurt weer de basis voor het plannen van een toekomstige handeling: wegrennen of naderen. Categorisatie van de waarneming is dus een eerste voorwaarde in het vormen van begrip en voor de menselijke handeling in de wereld. In media perceptie, en vooral bij kijken naar film en televisie, bepalen kijkers door middel van categorisatie tot welke genre de film of het programma behoort en dan vooral of het een fictie of een non-fictie productie is. Dit onderscheid is van belang voor de kijker omdat non-fictie, zoals weerberichten of oorlogen, directe gevolgen kan hebben voor zijn dagelijks leven, terwijl fictie veel meer als ontspannend vermaak kan worden waargenomen. In de theoretische introductie, Hoofdstuk 2, worden nog een aantal andere functies van genre categorisatie gegeven: zoals de invloed op de fysieke manier van kijken, het primen van interesse, en het opwekken van specifieke gemoedstoestanden en van narratieve en emotionele verwachtingen.

Hoewel genre categorisatie fundamenteel is voor de perceptie van film en televisie, is er verassend weinig onderzoek naar hoe kijkers tot een bepaalde categorisatie komen. Kijkers weten vaak van tevoren al tot welk genre een film behoort, door bijvoorbeeld informatie van vrienden, recensenten, televisiegidsen, titels, kennis over de hoofdpersonen, etc.. Maar in sommige gevallen, zoals bij het televisiezappen, is het genre nog niet bekend, en zal de kijker zich in zijn categorisatie moeten laten leiden door de cues (signalen) van het betreffende fragment. Bovendien kan verondersteld worden dat genre categorisatie een continu proces is: kijkers zijn continue bezig om de genre status, zelfs van een reeds gecategoriseerde film, te checken en eventueel bij te stellen – daarbij zullen zij altijd afgaan op cues van het betreffende fragment. In dit proefschrift is onderzocht welke cues kijkers gebruiken om tot een specifieke genre categorisatie te komen, alsmede de organisatie van de genre kennis van de kijker.

Van verschillende filmcues kan verwacht worden dat zij invloed hebben op de genre-categorisatie van de kijker, zoals: camera gebruik, geluid, editing, acteurs, dialogen, plots, settings en attributen. Al deze en andere filmcues kunnen in twee basale groepen ondergebracht worden: cues behorend bij een event (gebeurtenis), en cues behorend bij een filmische realisatie van die gebeurtenis. Ofwel,

cues van het verhaal en cues van het beeld. Genre theorie baseert het onderscheid tussen de genres traditioneel op verschillen in verhaal cues. Dit komt door de mythologische, verhalende, oorsprong van de basis genres: "gelukkig weerzien" gebeurtenissen komen vooral voor in drama's, terwijl "achtervolgingen" vooral in het actie genre voorkomen. Wanneer echter achtervolgingen uit verschillende genres worden vergeleken, zoals in Hoofdstuk 1, blijkt dat er grote verschillen bestaan tussen de genre typische filmische realisaties van een event: deze verschillen bijvoorbeeld in camera gebruik, achtergrond muziek of acteursbewegingen. Het lijkt aannemelijk dat kijkers zich in hun genre categorisatie zeker laten beïnvloeden door zulke genre specifieke filmische realisatie cues. Het effect van zulke oppervlakte cues op classificatie wordt ondersteund door recente ontwikkelingen in de cognitieve psychologie, met name de perceptuele simulatie theorie (Barsalou, 1999). Deze theorie veronderstelt dat de menselijk conceptuele en categoriale kennis "gegrond" is in de waarneming. Oppervlakte cues, waaronder de filmische realisatie cues, zullen volgens deze theorie een veel sterker effect hebben op de categorisatie processen dan voorheen werd aangenomen.

De Experimenten – Hoofdstuk 3

In drie empirische experimenten, met 44 tot 70 proefpersonen, zijn de genres cues getest. In het eerste experiment is het effect van filmische realisatie cues op genre herkenning vergeleken met het effect van event cues. Het tweede experiment onderzocht het effect op genre categorisatie van één specifieke filmische realisatie cue, i.e. snelheid. In het derde experiment zijn nog vier andere bewegingscues toegevoegd en is het effect ervan niet alleen getest op genre categorisatie, maar ook op esthetische en emotionele impressies. In sectie 3.1, is de motivatie voor de vijf bewegingsparameters gegeven.

Filmische Realisatie Cues versus Event Cues – Hoofdstuk 4

In dit experiment is getest of filmische realisatie cues net zo'n groot effect hebben op genre categorisatie als event cues. De stimuli bestonden uit korte filmfragmenten waarvan de beeldkwaliteit omlaag was gebracht om directe herkenning van de originele films te voorkomen. Als stimulus materiaal voor de event cue werden vier genre prototypische events gekozen: een *struikeling* voor het komische

genre, een *gelukkig weerzien* voor het drama genre, een *achtervolging* voor het actie genre, en *wachten op de lift* voor het non-fictie genre. Voor elk van deze vier events werden vervolgens acht prototypische filmische realisaties gezocht uit de vier genres: twee uit komedie, twee uit drama, twee uit actie en twee uit non-fictie. De stimulus set bevatte dus bijvoorbeeld een gelukkig weerzien scène uit een actie film (d.w.z. een drama event in een actie filmische realisatie), maar ook een achtervolging uit een drama film (d.w.z. een actie event in een drama filmische realisatie). Analyse van de resultaten wees uit dat: (a) de filmische realisatie cues een sterker effect hadden op genre categorisatie dan event cues – met uitzondering van drama categorisatie waar beide cues even sterk waren; (b) het effect van de prototypische event cues trapsgewijs minder werd voor respectievelijk drama, actie, komedie en non-fictie categorisatie – zie ook Figuur 2, Hoofdstuk 4, sectie 4.4. Met andere woorden: (a) mensen laten hun genre categorisatie zeker zo sterk bepalen door beeldaspecten als door verhaalaspecten; (b) het verhaal wordt het belangrijkst gevonden voor drama, dan voor actie, dan voor komedie en het minst belangrijk voor non-fictie (dit omdat de realiteit het meest varieert wat betreft zijn gebeurtenissen). Deze resultaten suggereren dat kijkers over specifieke genre kennis beschikken. Het lijkt erop dat deze kennis, in overeenstemming met de simulatietheorie, belichaamd is in enerzijds visuele simulators, en anderzijds in event simulators. Daarbij zijn de visuele simulators dominant over de event simulators – in ieder geval bij categorisatie taken van filmfragmenten tussen de 8 tot 24 seconden.

Snelheid Cues – Hoofdstuk 5

Nadat in het vorige experiment aangetoond is dat filmische realisatie cues een validiteit hebben voor genre herkenning, wordt in dit experiment het effect van bewegingscues, als onderdeel van de filmische realisatie cues, getest. Bij dit experiment is gekozen voor het variëren van de bewegingsparameter 'snelheid', omdat dit de 'moeder' aller bewegingsparameter is: als kan worden aangetoond dat snelheidsvariatie een effect heeft op genre categorisatie, dan kan meer gedetailleerd onderzoek naar andere bewegingsparameters volgen. Als stimulus materiaal zijn voor dit experiment wederom bestaande filmscenes genomen waarbij de beeldkwaliteit omlaag is gebracht. De scenes presenteerden allemaal een 'gelukkig weerzien'- event en

kwamen uit de volgende genrefilms: komedie, drama, actie en non-fictie genre. De afspeelsnelheid van de fragmenten was op drie niveaus gevarieerd: de originele snelheid, vertraging met een derde van de originele snelheid, en versnelling met een derde. Analyse wees uit dat snelheidsvariatie een effect had op de categorisatie van een fragment in het komedie en het drama genre, maar niet in het actie en het non-fictie genre (zie Figuur 2, Hoofdstuk 5, sectie 5.4): een versneld fragment verhoogde de passendheid in het komische genre terwijl een vertraagd fragment die verlaagde en de passendheid in het drama genre verhoogde.

Effect van vijf bewegingsparameters op genreherkenning – Hoofdstuk 6

Het positieve effect van de bewegingsparameter 'snelheid' op genre herkenning, leidde tot dit meer gedetailleerde experiment. Hier werden naast snelheid nog vier andere bewegingsparameters gevarieerd, en bovendien werd niet de beweging van het gehele fragment gevarieerd, maar alleen de bewegingen van een enkel object. Als stimuli werden achtervolgingen tussen twee abstracte blokjes geanimeerd. Daarbij zijn de volgende vijf bewegingsparameters van de achtervolger gevarieerd: snelheid, efficiency, vloeiendheid, detailgraad, en vervorming. Voor elk van deze parameters werden animaties gemaakt met de volgende vijf niveaus (--, -, 0, +, ++). Aan de proefpersonen werd gevraagd om voor elk fragment te beoordelen op (a) de genre passendheid (in komedie, drama, actie, en non-fictie), (b) de esthetische impressie (fascinerend, mooi, en verrassend), en (c) de emotionele impressie (grappig, droevig, indrukwekkend, en eng). Uit resultaten van het experiment bleek dat al deze afhankelijke variabelen werden beïnvloed door specifieke bewegingen: de prototypische en optimale bewegingen voor elke kijkerimpressie worden gegeven in Tabel 1 van Appendix B. Analyse toonde ook aan dat de elf afhankelijke variabelen ervaren werden als behorend tot de volgende drie onderliggende groepen/ factoren: *sensatie* (het actie genre, eng, verrassend, indrukwekkend, fascinerend en mooi), *realisme* (non-fictie (met postieve lading), komedie (-), en grappig (-)), en *sentimenteel* (drama, droevig, en mooi).

Algemene Discussie – Hoofdstuk 7

In dit hoofdstuk worden de uitkomsten van de experimenten kritisch samengevat en geïntegreerd met de theorie uit Hoofdstuk 2 en de hypotheses uit Hoofdstuk 3. Voor wat betreft de organisatie van genre kennis, was verwacht dat fictie bewegingen zouden worden waargenomen als getransformeerde non-fictie bewegingen. Experiment 2 (Hoofdstuk 5) liet zien dat non-fictie fragmenten beoordeeld werden als beter passend in een fictie genre dan fictie fragmenten in een non-fictie genre. Anders gezegd: het non-fictie genre kan zijn fragmenten beter exporteren naar een fictie genre dan dat het fictie fragmenten kan importeren. Experiment 1 (Hoofdstuk 4) toonde aan dat deze asymmetrische import/ export relatie tussen fictie en non-fictie wel geldt voor filmische realisaties maar niet voor events: non-fictie exporteert alleen zijn filmische realisaties naar fictie. Een mogelijke oorzaak voor deze potentiële non-fictie export is af te leiden uit de resultaten van Experiment 3, Hoofdstuk 6. Hierin werd getoond dat neutrale bewegingen herkend werden als prototypisch voor non-fictie. Bovendien bleek dat de grootte van de bewegingstransformatie bepaalde tot welk genre een scène gecategoriseerd werd; neutrale bewegingen werden gecategoriseerd als non-fictie, matig getransformeerde bewegingen als drama en actie, en sterk getransformeerde bewegingen als komedie – zie Figuur 5, Hoofdstuk 6, sectie 6.4. De resultaten van de drie experimenten suggereren dus dat het verschil tussen fictie en non-fictie genres mentaal wordt gerepresenteerd als een afwijking van realistische simulators.

Uit de drie experimenten bleek ook dat gemiddelde kijkers over een zeer gedetailleerde genre kennis beschikken die vergelijkbaar is met die van experts, hoewel de kennis van deze laatste groep waarschijnlijk expliciter van aard is. Bewijs voor het bestaan van de genre kennis van de gemiddelde kijker is dat zij korte en visueel verstoorde filmfragmenten zonder problemen als de juiste originele genres categoriseert (zie Tabel 1, Hoofdstuk 4, sectie 4.4). De verfijnde aard van genre kennis blijkt uit het feit dat de categorisatie onder andere werkt met transformaties, d.w.z. hogere orde karakteristieken van filmische realisaties. Bovendien bleek dat de basale genres, komedie, drama, actie en non-fictie, geen afzonderlijke mentale categorieën zijn, maar dat zij georganiseerd zijn naar gelang hun afwijking van non-fictie.

Een aantal vragen blijven na deze studies nog open voor verder onderzoek. De eerste is of de, middels off-line analyses, gevonden genre-kennis-organisatie ook bevestigd kan worden in on-line categorisatie experimenten – bijvoorbeeld m.b.v. reactietijden of fMRI. Een tweede vraag betreft de generaliseerbaarheid van de gevonden resultaten: (a) zijn de gevonden genre en emotionele effecten van beweging cues inderdaad invariant ten opzichte van het event – geldt hetzelfde effect ook voor andere animaties dan achtervolgingen zoals verwacht? en (b) zijn de gevonden effecten van bewegingscues invariant ten opzichte van het object dat deze bewegingen uitvoert? Een antwoord op deze laatste vraag wordt mogelijk gemaakt door verder onderzoek. NWO heeft mij een beurs toegekend om twee jaar onderzoek te doen bij het Geneva Emotion Reserach Group van Klaus Scherer in Geneve. Ik zal daar testen in hoeverre de emotionele en esthetische kijkersimpressie van expressive bewegingen worden beïnvloed door de visuele abstractie graad van het object dat deze bewegingen uitvoert. De verwachting is dat de emotionele response op bepaalde sterk emotionele bewegingen, zoals krioelen of stuiteren, onafhankelijk is van het object dat deze bewegingen uitvoert: zulke bewegingen worden waarschijnlijk waargenomen als een soort van emotioneel Gestalt.

De resultaten van dit proefschrift dragen bij tot zowel genre theorie als cognitieve psychologie. Het presenteert enerzijds één van de eerste empirische genre experimenten in het veelal theoretische en historische domein van genre- en film theorie. Anderzijds zijn deze experimenten één van de weinige studies die een cultureel onderwerp, zoals genre, onderzoeken binnen de recente ontwikkelingen van de cognitieve psychologie. Daarnaast denk ik dat de resultaten ook praktisch toepassingen kunnen hebben zoals bijvoorbeeld in animatie-films, computerprogramma's die genres genereren of herkennen, in toneel, dans en commercials, in interface ontwerpen, speelgoed en robots, en dat ze een bijdrage kunnen vormen in algemene media literacy.

In het algemeen heeft dit proefschrift heeft op een empirische manier getracht enkele onderliggende processen bloot te leggen van het kijken naar, en genieten van een complex artistiek product als film. Het is een begin, en ik hoop dat het in toekomstige onderzoeken verder kan worden uitgewerkt.

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[1] This filmography lists the films to which the text of the dissertation refers. A list of the film fragments in Experiment 1 and 2 is presented in the Appendices of Chapter 4 and 5, respectively.

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Modern Times (1936). dir.: Ch. Chaplin. USA.

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Parade (1974). dir.: J. Tati. Sweden.

Requiem for a Dream (2000). dir.: D. Aronofsky. USA.

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Singin' in the Rain (1952). dir.: S. Donen & G. Kelly. USA.

Terminator, The (1984). dir.: J. Cameron. USA.

Thirteenth Floor, The (1999). dir.: J. Rusnak. Germany.

Total Recall (1990). dir.: P. Verhoeven. USA.

United 93 (2006). dir.: P. Greengrass. USA.

APPENDICES

Appendix A

Animation Details of The Movement Parameters; A Worksheet

General Settings

A Maya animation of a running chase, in which the characters (A and B) are represented by respectively a full orange and light yellow abstract oval shaped block. Other elementary scenic elements are a background sky, represented as a blue/ white fade, and a floor consisting of a grey grid. In the first frames B enters the screen at the left side and moves with a constant velocity to the right, chased a few frames later by A.

Colours:
Colour A (orange, chaser):   H=24, S=1, V=1
Colour B (yellow, chased):   H=44, S=0.9, V=1

Camera:
- Shutter angle camera = 144
- Depth of Field is linked to the middle of the distance between both objects and has an F stop of 20 in **v+** and an F-stop of 4.5 in **v-** (a difference caused by **v**'s scaling procedures of the camera) .
- Angle of view 49.

Render settings:
- 3D motion blur with a blur by frame rate of 0.3.

Lights:
- 2 ambient lights without shadow casting positioned at the beginning and at the end of the track.
- 1 directional light casting depth map shadows.

Duration:
- 600 frames, or 25 seconds in which 450 frames show the chasing of the objects and 150 frames show the end of the chase by means of a camera movement coda. This camera coda is only shown in the introduction film of the experiment - it is removed from the stimuli films.

Trajectory:
There are 6 corners; the average speed of the orange block is constant. However, at each corner a key is placed, its fixed symmetrical angles ranging from 0 degrees (flat in the last corner) to 0.13 (no effect):

Keys	Time	Value	In Tan Angle	In Tan Weight	Out Tan Angle	In Tan Weight
0	34	0	0	59	0	59
1	211	0.3756	0.12	59	0.12	26
2	289	0.5745	0.1	26	0.1	11
3	322	0.6585	0.08	11	0.08	10.33
4	353	0.7368	0.06	10.33	0.06	13
5	392	0.834	0.04	13	0.04	13.67
6	433	0.9338	0.02	13.67	0.02	6.66
7	453	0.996	0	6.66	0	6.66

Five independent variables with five levels

1. **Velocity**

The difference in the five levels of velocity is achieved in the animation by scaling exponentially by 1.5 subsequently the floor, both objects (and their lattice) and the angle of view of the camera, while the dimensions of the track remain constant. In other words, everything is scaled except the track and its time.

					transform
		x	y	y	y
	v --	8.17	20.42	20.42	8.05
	v -	5.45	13.61	13.61	5.78
pCube 1/2 en Lattice Bases	v 0	3.63	9.075	9.075	4.257
	v +	2.42	6.05	6.05	3.265
	v ++	1.61	4.03	4.03	2.59

		x	y	y
	v --	3628.35	3628.35	3628.35
	v -	2418.9	2418.9	2418.9
Floor	v 0	1612.6	1612.6	1612.6
	v +	1075.07	1075.07	1075.07
	v ++	716.71	716.71	716.71

	v --	110.25
	v -	73
camera angle of view	v 0	49
	v +	32.67
	v ++	21.78

Adjustments:

- Adjustments to the y-rotation of the camera had to be made to synchronise the position of the blocks on the screen for each velocity variation. This results in a faster turning speed and more turning

points of the camera at the high velocities, and slower and less turning points at the low velocities.
- Adjustments to the y-translation of the camera had to be made to synchronise the angle of framing of the blocks (otherwise, the low velocity would have a low camera angle due to the large size of the blocks, and the high velocity would have a high angle).
- The screen distance between the blocks is adjusted to be equal in all variations

2. **Efficiency**

The ratio between the energy a character uses to achieve his goals and the energy that is minimally needed to achieve that goal, determines the degree to which an action is perceived as efficient. This parameter is linked to velocity; the route varies but not the time; this suggests the viewer's perceived intentions of A, i.e. its degree of anticipation. A's anticipation is also visible in the angle of the tangents at A's keypoints: the longer the pause in the movements, the longer it seems that A performs a mental action of anticipation. However, to avoid direct interference with the variables detail and fluency, I kept 6 middle keys with increasing angles.

Description of the efficiency variations

e ++: A takes the shortest route to B - an almost straight line. A's keys are placed between each of two crossroads (or in the middle of its barely straight corner.) The position of the keys is replaced so that A is at a crossroad when B is in the outer position of its corner. The key centres of A, effective in A's velocity variation, are placed at those moments when B takes a corner. This gives the impression that A waits to see what B will do, or to better verify its anticipation of B's movement. As the route of A is much shorter than in all the other variations its velocity is also lower and its motion curve different. The different motion curves asked for different key weights; otherwise the relative velocity in- or decreasing would be larger, resulting in a perceptual variation of *fluency and detail*. To compensate, I changed the key weights by hand to a perceptual equivalent to the v0 velocity variation; that is, barely any variation in perception velocity.

e +: A's route is in the middle between its route on e ++ and e 0. The corners are leaning slightly backward as an effect of A's anticipation. A's keys are, as in v0, in the middle of its corners. The key centres of A, effective in A's velocity variation, are placed at those moments when B takes a corner. This gives the impression that A waits slightly to see what B will do, or to better verify its anticipation of B's movement.

e - : A's track is mirrored to e+, with the centre of the corners leaned slightly forward. The position of the keys is changed so that B takes a corner when A is very near to him. The longer route leads to a high velocity of A. This asks for modification of key angles (otherwise the velocity difference would be too large - fluency would dominate efficiency).

e --: A's track is twice as wide as in e-. Its corners are leaned strongly forward resulting in some backward movements along the horizontal axis (all other tracks result only in a backward movement along the vertical axis).

3. **Detail**

I propose that nonfiction movements are characterized as being less intentional than fiction movements. Low intention is translated in movement by more movements, randomized movements, and detailed or very small movements:

- o   More movements; tested by manipulating the number of velocity keys;
- o   Random movements: more keys make a movement more complex and more difficult to attribute to an intention in the movements – especially in a plain intentional script such as a chase.
- o   Detailed or little movements: more keys diminish the velocity difference between each set of 2 keys.
- o   The angle of the keys gradually increases over the amount of used keys: from no angle in the first unsharp

turn, to a maximum angle (a gradual start/stop situation)
in the last sharpest turn.

Overview of the placed keys in the succeeding detail levels:

d -- no keys	d - 3 keys	d 0 6 keys	d + 12 keys	d ++ 24 keys
34				
				78
			122	
				166
	211			
				230
			250	
				269
		289		
				297
			305	
				313
	322			
				329
			337	
				345
		353		
				362
			372	
				382
	392			
				402
			412	
				422
		433		
				438
			443	
				448
453				

4. **Fluency**

f ++   splinear tangents: angles are halved in relation to f+, resulting in almost horizontal tangents or minimum stops.

Keys	Time	Value	**In Tan Angle**	In Tan Weight	**Out Tan Angle**	In Tan Weight
0	34	0	**0**	59	**0**	59
1	211	0.3756	**0.03**	59	**0.03**	26
2	289	0.5745	**0.025**	26	**0.025**	11
3	322	0.6585	**0.02**	11	**0.02**	10
4	353	0.7368	**0.015**	10	**0.015**	13
5	392	0.834	**0.01**	13	**0.01**	13
6	433	0.9338	**0.005**	13	**0.005**	6
7	453	0.996	**0**	6	**0**	6

f +   splinear tangents with the angles halved in relation to f0.

Keys	Time	Value	**In Tan Angle**	In Tan Weight	**Out Tan Angle**	In Tan Weight
0	34	0	**0**	59	**0**	59
1	211	0.3756	**0.06**	59	**0.06**	26
2	289	0.5745	**0.05**	26	**0.05**	11
3	322	0.6585	**0.04**	11	**0.04**	10
4	353	0.7368	**0.03**	10	**0.03**	13
5	392	0.834	**0.02**	13	**0.02**	13
6	433	0.9338	**0.01**	13	**0.01**	6
7	453	0.996	**0**	6	**0**	6

f 0   (= v0) splinear tangents with angles ranging from 0.13 at the
first turn to 0 degrees at the last turn:

Keys	Time	Value	In Tan Angle	In Tan Weight	Out Tan Angle	In Tan Weight
0	34	0	0	59	0	59
1	211	0.3756	0.12	59	0.12	26
2	289	0.5745	0.1	26	0.1	11
3	322	0.6585	0.08	11	0.08	10.33
4	353	0.7368	0.06	10.33	0.06	13
5	392	0.834	0.04	13	0.04	13.67
6	433	0.9338	0.02	13.67	0.02	6.66
7	453	0.996	0	6.66	0	6.66

f -   linear tangents with a pause of 1 frame after each key
f --   linear tangents with a pause of 6 frames after each key

5. **Deformation**

of occupied body space which is linked to A's flowness with an
envelope value of 0.4 *(B has a 7.5 x 3 x 7.5 volume and takes corners with
medium flow: envelope = 0.2)*:

The proportion of A, including its lattice base, is exponentially varied
by one third over the height and width of object A:

	(d x h x w)
p ++	3.63 x 16.13 x 5.10
p+	3.63 x 12.10 x 6.81
p0	3.63 x 9.075 x 9.075
p-	3.63 x 6.81 x 12.10
p--	3.63 x 5.10 x 16.13

Appendix B

Movement Optima and Prototypes

Movement Optima

Table 1 presents the optimal movements for each impression in the column "opt". The optima are those levels of each parameter that are judged to fit best *within* a specific impression. As a statistical requirement, an optimum level should fit significantly better in a genre or impression than at least one of the other levels of that movement parameter. Significance is measured using Games-Howell post-hoc tests with $p < 0.05$.

Movement Prototypes

The prototypical movements for an impression are shown in the column "pro" of Table 1. The 11 impressions are categorized into 3 groups: genre, emotion and aesthetic. The prototypical movements are those movements that fit significantly better in one impression than in any of the other impressions of the same group, using paired sample t-tests. The effect sizes of the movement parameters for each of the impressions can be found in Figure 4 of Chapter 6, section 6.4.

From Table 1 below, and Figure 4 just referred to, the following conclusions can be drawn. Recognition of the comic genre seems to be more dependent on a correct adjustment of movements than the recognition of any other genre. Drama recognition appears to be less dependent on displayed movements: drama is only characterized by slowness and by moderate fluency. These two findings are in line with (Visch & Tan, submitted) who showed that drama recognition, compared to comic recognition, is much more dependent on event cues than on image cues, such as movements. Action recognition seems to be affected by high velocity and low efficiency. That low efficiency is prototypical for action may be caused by the inverse relation of the parameter efficiency and velocity: a chase with low efficiency, taking the outer corners, results in high velocity. The best nonfiction fittingness judgement is apparently achieved with the sample of the neutral movement (level 3). The neutral film, level three, leads to a prototypical sad impression, although this neutrality is never an optimum. The scary impression

177

seems to be influenced by the movement in almost the same way as the impressive impression (r_s = .66). The most striking exception is that the moderately high proportion is much more scary than impressive (t = 2.11, $p < 0.05$). Table 1 shows only the fascinating impression has prototypical scores. This may be due to the test material of the 3D animations that we used. The surprise impression seems to be strongly affected by all five parameters with their extreme levels as main optima – level 3 is never an optimum. The impression of beauty seems to be mainly affected by efficiency, velocity and fluency.

		velocity		efficiency		fluency		detail		proportion	
		opt	pro	opt	pro	opt	pro	opt	pro	opt	pro
gfj	comic	1		1 5	**5**	1	**1**	4 5		1 2 5	**1 2**
	drama	1	**1**			4					
	action	5	**5 4**	1 2	2						
	non-fiction		3	3	**3**	3	**3**	3	**3**	3	**3**
ei	funny			1 5		1	**1**	4 5	**5**	1 2 5	
	sad	1 2	**1 2 3**	5	3		3		1 3		3
	impres-sive	5	**5 4**	1 5	**1**	1 5	**5**	4			
	scary	4 5		1 4 5						4 5	**4**
ai	fasci-nating	5	**5 4**	1 5	2	1 4 5	**5**	2 4 5	**2 4 5**	1 2 4 5	**4**
	beauti-ful	1 4 5		1 5		4 5					
	surpri-sing	5		1 5		1 5		2 4 5		1 5	

Table 1. Optimal (opt) and Prototypical (pro) Settings of Level and Parameter for the Dependent Variables.
- gfj = genre fittingness judgement; ei = emotional impression; ai = aesthetic impression.
- The levels printed bold are levels that are both optimal and prototypical.
- level 1 = --; level 2 = -; level 3 = 0; level 4 = +; level 5 = ++

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