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# Designing a New Method of Studying Feature-Length Films

## An Empirical Study and its Critical Analysis

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**Abstract:** Measuring viewers' experiences of films has become a critical issue for filmmakers because all kinds of audiences now have access to new releases from all over the world. Some approaches have focused on the cognitive level of the experience, while others have emphasized the structure of films. Additionally, some have used quantitative objective methods to examine audience reactions to short film sequences, while others have applied qualitative approaches to study feature-length films. However, an integrated method that combines the features of these approaches is needed. In this article, we describe a new method that combines quantitative and qualitative data to study viewers' experiences of different structural features of films. This method involves an online subjective response mechanism that can be used to capture and measure the experiences of different target audiences as they watch movies of different lengths.

**Keywords:** audience experience, emotion, emotional responses, feature-length film, measurement, method construction

The development of the film industry in the last decades has boosted studies aiming to understand audience behavior and to predict the success of films (Eliashberg et al. 2006). However, little is still known about the film elements that elicit audience interest, and there are still limited empirical analyses regarding the features that produce emotional experiences in viewing audiences. In this article, we aim to introduce a methodological approach that allows for the analyzing of viewers' reactions to feature-length films. With this aim, we discuss first previous studies that have used different methodological approaches, and then introduce our mixed-method procedure and provide empirical data to support its validity and reliability. In our review, we do not

pretend to exhaustively discuss the large number of methods and studies on film perception and emotional appraisal, but merely to illustrate how different methods have been used to address specific problems and questions, and thereby to provide a framework within which to discuss the advantages and limitations of our specific method and procedures.

Historically, producers and creators have based their film analyses and predictions on vague observations of previous successes and failures without a complete understanding of which film elements produce satisfactory experiences in individuals (Bordwell 1989; Eliashberg et al. 2006). Thus, for a long time the film industry was considered a high-risk investment, since it was quite difficult to predict outcomes. More recently, audience surveys and box-office statistical analyses of audience behavior have been used to predict the success of films (Elberse and Eliashberg 2003; Eliashberg and Sawhney 1994). However, these approaches have shown that success depends not only on the quality of each movie element (e.g., scriptwriters, actors, music, technicians, and producers) but also on how these elements come together. They also seem to depend on external events that may be related to unforeseen macroeconomic variables, historical elements, and cultural factors that influence audiences (Dempster 2006; Grodal 2009; Gunter 2018; Hwang et al. 2016). Reducing the risks posed by such external factors is an important concern for producers. For this reason, empirical research has more recently been directed not only toward statistically predicting the behavior of prospective viewers (Gunter 2018; Hwang et al. 2016; Oh et al. 2017), but also toward understanding both the cognitive and emotional factors underlying film perception.

However, films are difficult to study because they integrate complex elements and artistic media to convey meanings and emotions (Gross and Levenson 1995). Different elements of a film—such as its length, shot composition, camera movement, music, and script, as well as the quality of its actors—help convey meaning to and produce emotions in the audience. Because of this complexity, different researchers have focused on varying aspects of film (structure, perception of continuity, appraisal of meaning and emotions, etc.). Thus, several studies (e.g., DeLong et al. 2014; Redfern 2014) have examined the shot structures of different films by comparing the frequency of the shot lengths in the picture or the composition of the shot lengths in particular scenes. This structural feature can be studied either across films or across scenes in a film, and it might reflect stylistic differences among films and scenes that can be used to characterize various types of films or the structures of scenes according to their meanings and/or contents (Redfern 2014). Other studies have focused on particular narrative devices, such as the cut or the placement of objects in a scene, to identify their functions and meanings (Bordwell and Thompson 2004).

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From a cognitive perspective, some researchers have concentrated on perceptual aspects to describe how the visual system reacts to structural features to create impressions of continuity, disruption, or motion (Bordwell 1989; Bordwell and Thompson 2004; Poulaki 2015; Smith 2012; Sobchack 1990). For example, cuts (junctures between shots) need to be edited to bridge and maintain continuity despite the break in the spatiotemporal physical features of the displayed activity. Some research (Magliano and Zacks 2011; Murch 2001) has sought to understand the mechanism used by an individual's perceptual system to interpret an activity that has been cut as continuous. For example, Walter Murch (2001) has suggested that cuts are perceived as continuous, because they are similar to natural visual discontinuities produced by eye movements or blinks. Joseph Magliano and Jeffrey Zacks (2011) also argue that some cuts can be hidden when they placed within or before a period of fast motion. In this sense, these studies address the structural features of film that serve to define styles, perceptions of cuts, and continuities with the intention of conveying meaning.

Other approaches have focused on both cognitive and emotional contents of films and their affective impact on audiences (Grodal 1997; Plantinga 1999; Smith 1995; Tan 1996). Recently, a few studies have taken the user-experience approach to assess how different aspects of films affect the viewers' experience (Silvia and Berg 2011; Tarvainen et al. 2014). User design is a model that aims to create products that are intended to meet each user's specific needs so that these products generate a greater degree of satisfaction—and therefore better (e.g., happier) experiences. What matters when using a product is the overall user experience, including the user's thoughts, perceptions, and feelings (Tullis and Albert 2013). Applying these concepts to filmmaking involves exploring how the audience experiences different features of the product and whether these features have the desired impact on the audience. Taking the user-experience approach might be critical for increasing a film's ability to *move* and *interest* an audience. A film's impact and viewers' interest in it may be enhanced by understanding the factors affecting the audience's emotional and cognitive experiences (Garrett 2011; Helfenstein 2012; Norman 2005) and by identifying which elements of a film elicit the audience's interest. In this article, we focus on this user-experience approach to introduce a method that will allow us to assess a complex emotion such as interest.

Interest, as an emotional construct, is a central concept in the field of aesthetics (Silvia and Berg 2011) and may also be critical for attracting viewers to a film. This complex construct involves appraising the *novelty* and the *complexity* of the aesthetic product (e.g., film), on the one hand, and appraising an individual's capacity and resources to cope with said novelty and complexity, on the other (Silvia 2008). When applied to a film, this concept means that people assess the extent to which the film introduces complex, unexpected,

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and novel elements and whether the audience will be able to understand these elements. Thus, a film may evoke interest when it is appraised both as being complex and difficult to comprehend *and* as possessing sufficient resources for audience members to cope with this complexity and difficulty. According to Paul Silvia and Christopher Berg (2011), when a film is appraised as being complex and difficult and as lacking the resources for audience members to cope, said film will wind up creating not interest but its opposite, confusion. A film's complexity and novelty may come from different types of attributes, including stylistics, aesthetics, or affective aspects, and these may be based on combinations of visual features, shot types, script elements, or musical features. Therefore, it is difficult to isolate these elements to identify their effects in terms of producing emotional content and interest. Two fairly recent studies (Silvia and Berg 2011; Tarvainen et al. 2014) have attempted to identify these elements by asking people to rate the novelty, complexity, interest, and emotion elicited by short clips of pictures of different genders. However, the appraisal of a film's novelty, complexity, and comprehensibility may differ when watching clips of said film and not the entirety of said film. Therefore, it might be important to assess *interest* when people have the opportunity to watch fully scripted films as they unfold in real time. Fully understanding the perceptual, cognitive, and emotional process that leads an audience to be interested in a film may require studying both clips and full-length films, as well as combining structural and psychological variables. From this perspective, it is essential to develop methodologies that combine all these aspects and allow researchers to shift from performing macro-analyses to performing micro-analyses of films and from examining structural aspects to examining cognitive and emotional aspects of films. However, this has not been the case; audience reactions to films have traditionally been measured by using qualitative, intuitive analyses of interactions with a few viewers (Tan 1996) or by using short sequences and/or clips as objective analytic tools.

In this article, we aim to offer a methodological tool that combines quantitative and qualitative data (a mixed-method approach) to assess the impact of a feature-length film and the sequences and the scenes of which is composed. We aimed to obtain data that would assess different aspects of the movie *via-à-vis* viewers' (online and offline) reactions. For this, we used a quantitative online subjective response mechanism that allowed viewers to identify the sequences in the film that drew their interest and that they thought were central to understanding the film, and we combined this quantitative method with qualitative analyses of viewers' responses to questionnaires. Thus, we used mixed methods both as a means of triangulation and as an explanatory design (Borrego et al. 2009). First, we used complementary data sources concurrently to strengthen the validity and reliability of our procedure

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(triangulation design); next, we combined quantitative (subjective response mechanism) and qualitative (interviews) methods to enable us to interpret the quantitative data and provide said data with meaning (Creswell and Clark 2017; Creswell et al. 2003).

Our objective was to draw on the strengths of each data source (triangulation, complementarity, and diversity) and to try to reduce some of the limitations (validity and reliability issues caused by too much confidence in triangulation). We thus followed recent recommendations on data collection and analysis methods of impact evaluation to integrate different data collection methods and triangulate various sources (Bamberger 2012; Peersman 2014), while addressing validity and reliability problems (Onwuegbuzie and Johnson 2006). Mixed-method research has been successfully applied to the assessment of technological devices in medical (Davies et al. 2012) and educational (Borrego et al. 2009) settings; we aim to extend it to the assessment of audience reactions to films.

Thus, in this article, we describe the use of a quantitative instrument (subjective response mechanism), including its reliability and validity, and the use of qualitative data from questionnaires to illustrate how this mixed-method approach can be used to (1) extract and compare the emotional profiles of different movies; (2) select sequences in a film based on the viewers' interest; or (3) investigate the impact of the sequences on different audiences. Although the data presented below has a methodological focus and is not intended to address a particular theoretical question, we aimed to show that complex theoretical film concepts such as *interest* can be reliably measured, and that, in doing so, we can help to specify their cognitive and emotional structure when applied to describing emotional experiences of film. In this sense, we expected that sequences introducing novel elements and combining positive and negative emotional reactions in the viewers (complexity) would also be considered as more *interesting*. We also want to clarify that, in our view; no single method (including ours) can address the variety and the complexity of the questions that can be raised regarding viewers' experience of a film. Our aim is to stress that various approaches can all be combined to provide richer and more reliable and valid conclusions. Our method is quite useful in providing a full view of the general interest in and emotional profile of a film, as well as in selecting sequences for further study based on the specific interest characteristics that we explore. As we will mention below, in the Discussion section, we think that a similar approach (including the subjective response mechanism) may also be used to assess other aesthetic emotions, such as the extent to which a film's elements "stir" an audience (Kuehnast et al. 2014; Menninghaus et al. 2015) and produce feelings of beauty or pleasantness (see Tarvainen et al. 2014). And we believe that we can do this not only with feature films, but also with other audiovisual and creative products in the context of entertainment,

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marketing, or advertising. We thus describe our mixed-method approach (voting plus interviews and questionnaires) but also note that the subjective response mechanism can be combined with other quantitative data, such as eye gazes, EEG (electroencephalography) recordings, and reaction time.

## **Method**

### **Participants**

A group of 59 Spanish participants (mean age = 22.7; SD = 3.01; 36 women and 23 men) participated in the study. They were recruited in Granada, Spain, through a Facebook announcement that explained the study's purpose and procedures. They were given the choice of different dates, were informed that three films would be shown, and were told that they would be offered food and beverages in between screenings. The participants were divided into six groups according to their preferred dates; the group sizes ranged from 5 to 18 members. Although 59 participants can be considered insufficient for instrument development, it is important to note the large number of data points obtained from each participant across the different sequences of the films.

Since previous studies suggest that experts take a more critical, artistic approach to viewing films than ordinary viewers (Silvia and Berg 2011), and since our focus was on the latter group, we avoided participants who had worked in the film industry (or related industries), as well as participants who had studied film or related subjects. As the participants' levels of knowledge about films varied, we adapted Silvia and Berg's (2011) questionnaire to assess the participants' knowledge about and interest in the films. The mean interest in the movies in the sample was 3.58 (SD = 0.77) on a scale ranging from 1 (low interest) to 5 (high interest).

### **Materials**

We selected the following three films that were produced in different countries and languages and that shared a genre (drama) and a main theme (children of war): *The Empire of the Sun* (Steven Spielberg, 1987) from Hollywood, *Ispansi!* (Carlos Iglesias, 2011) from Spain, and *Mother of Mine* (Klaus Härö, 2005) from Finland. We chose these films, since they dealt with the same topic from three different cultural perspectives. This approach will also help us perform future analyses on how cultural background and orientation influence film perception by comparing Spanish and Finnish audiences. For example, Spaniards will be familiar with the story of the Spanish Civil War presented in *Ispansi!*, while the Winter War (which occurred in Finland) presented in *Mother of Mine* will be unfamiliar to them. In this sense, the World War II episodes presented in *Empire of the Sun* are from a conflict that is more internationally known. However, we will not discuss these issues here, for we want to focus wholly on the issue of methodology.

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Additionally, the three films included in this study all depicted a balance of positive and negative emotional experiences, which made it suitable to assess their emotional profiles. The Finnish and the US films had Spanish subtitles. Due to space constraints, we focus here on only one film (*Ispansil*, see Appendix) and refer to the data from the other films as needed. The full dataset has been discussed elsewhere (Cañas-Bajo et al. forthcoming).

### **Procedures**

The six days of screening were held over a two-week period. During the first week, the sessions were held from Friday to Sunday; in the second week, they were held from Tuesday to Thursday. The films were screened in a standard-size theater room; they began at 11:00 am and finished at 7:00 pm. Each session was divided into three parts, one for each film. Each part was divided into three phases: prefilm, film, and postfilm. The participants had a break (thirty to forty-five minutes) after each film, during which they had the option of eating the food and beverages that we offered them.

The first phase started before the movie and lasted approximately ten minutes. In this phase, the participants read a brief synopsis of the film and were asked about their expectations of the film. They were also asked to fill in a questionnaire regarding their knowledge of and interest in movies (Silvia and Berg 2011). In the second phase, after completing the questionnaire, the participants were asked to watch the film and to mark the more central and interesting sequences of the film by using a subjective response mechanism consisting of a handheld stick with two Bluetooth buttons (which represented positive and negative valence, respectively). This subjective response mechanism was intended to provide online indexes of *interest* and *emotional valence* (the two different buttons served to signal positive and negative emotions). This subjective response mechanism was synchronized with the movie so that we registered and were able to analyze what parts of the film generated more responses and whether these responses were negative or positive in emotional valence. Thus, interest was operationalized as the number of responses on a sequence, while valence was categorized as positive or negative, depending on the number of responses on each valence (positive and negative). Although we recognized that the two measures obtained from our device might not be independent and that interest and valence were related in complex ways (Tavainen et al. 2014), we decided to ask the participants for both, since the appraisal of interest and the appraisal of valence occur simultaneously when one naturally experiences a film. Therefore, our setup seems to have been ecologically close to what people actually do in most film-viewing situations. Further studies will need to address the impact of dual appraisal.

In the third phase, after they finished watching each film, the participants were asked to fill in another questionnaire on what aspects of the film they

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found most interesting. Thus, the data from the subjective response mechanism was complemented by offline data on the viewers' reactions in the form of their qualitative answers to the questionnaire about which aspects and sequences of the film elicited their interest. These answers provided further qualifications of the film's features that induced the viewers' interest beyond simple quantification.

Before the actual study, we conducted a pilot study involving 13 participants. Before the pilot study, the system went through two rounds of refinement to make it as simple and as usable (i.e., user-friendly) as possible. The subjective response mechanism adopted a cell-phone-based system used in classrooms to receive immediate feedback from students and obtain responses to class-content questions. However, we introduced a different physical device, since we figured that cell phones would be disruptive to the participants as they watched the movie. We aimed to develop a system that participants could use without having to shift their attention away from the movie. In our pilot study, the participants were asked to watch a movie and were instructed to use the subjective response mechanism. Afterward, they filled in a questionnaire that asked (1) whether the subjective response mechanism was easy to use (yes/no); (2) whether the instructions were easy to understand (yes/no); and (3) whether they felt that using the subjective response mechanism interrupted their concentration (yes/no). They were also provided space to explain any negative answers. The pilot study's results indicated that 77 percent of the participants found the subjective response mechanism easy to use, 100 percent thought that the instructions were easy to understand, and 92 percent reported that the subjective response mechanism did not interrupt their concentration. Two participants mentioned that they did not like the mechanism because the buttons were too soft, which made them unsure as to whether or not they had responded. However, since there were no further complaints and since the subjective response mechanism seemed to work properly, we went on to use the mechanism in the study proper.

### **Results**

We analyzed the number of responses per sequence as a proxy for the overall interest in each movie. We used the "sequence" as the unit of analysis because a film sequence constitutes "a series of related shots and scenes in a film, analogous to a book chapter, which constitutes a significant phase of action or a move in the plot" (Kuhn and Westwell 2012). Hence, for the analyses we divided the movies into sequences and counted the number of registered responses by each participant for each sequence. The three films had a similar number of sequences, as follows: 41 in *Empire of the Sun*, with a mean length of 3 minutes and 27 seconds; 42 in *Ispansi!*, with a mean length of 2 minutes

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and 17 seconds; and 41 sequences in *Mother of Mine*, with a mean length of 2 minutes and 23 seconds. Since there were large individual differences in the number of responses among the participants, we normalized the data by calculating absolute Z-scores (higher scores represent more responses) for each participant. We then calculated the mean average score for each scene and plotted them in a graph to visualize the overall interest in the movie as the sequences unfolded. Figure 1 represents the mean Z-scores for each sequence of *Ispansi!*.

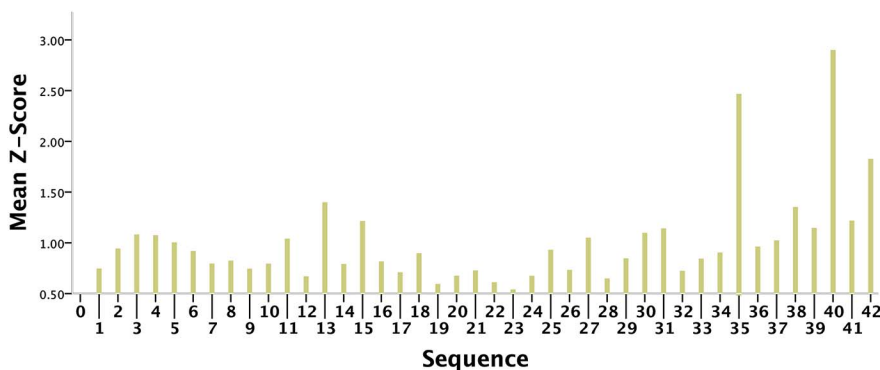


Figure 1. Mean Z-scores for each sequence of *Ispansi!* (Maestranza Films / Saga Productions / Un Franco 14 Pesetas).

### General Emotional Profile of the Movie

The voting data can be used to obtain an emotional profile of the movie over time (sequences). For example, Figure 1 provides a time x interest profile of *Ispansi!*, that is, how the degree of *interest* varies as the sequences unfold in real time. Inspection of this figure shows that high levels of interest are concentrated at the end of the movie. This overall profile is interesting, since studies on the narrative structure of films suggest that the majority of them consist of three or four acts (Bordwell 2006; Field 2005; Thompson 1999). This narrative structure seems to be reflected in the interest profile shown in Figure 1. It clearly illustrates three peaks of interest that correspond to the resolution of the main plots in the narrative structure. These are found in sequence 35, where the Spaniards' exodus to Russia comes to its end; in sequence 40, where the main character returns to Spain and the movie describes the new national situation under Franco's regime; and, finally, in sequence 42, which takes place twenty-five years later when Franco dies and the news of his death reaches the exiles in Russia. The generality of this overall pattern has been replicated in a study that compared different films with a similar narrative (see Cañas et al. forthcoming). An interesting direction for further research would be to try to extend these findings to other film genres and styles.

### **Interest distribution**

To characterize the distribution of Z-scores reflecting film interest, it is also possible to look at the mean scores per sequence and display the frequency of Z-scores across sequences. Figure 2 shows the distribution of scores for *Ispansi!*.

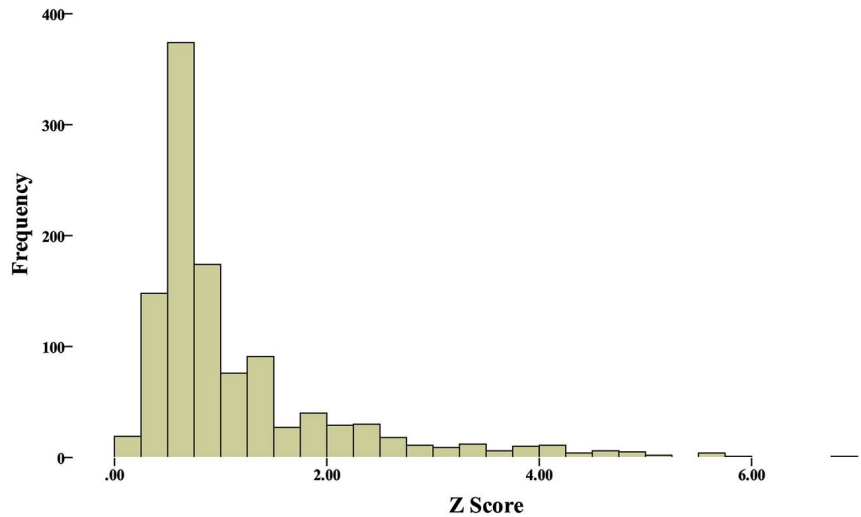


Figure 2. Frequency distribution of interest Z-scores for *Ispansi!* (Maestranza Films / Saga Productions / Un Franco 14 Pesetas).

Figure 2, in conceptual terms, provides a profile of the overall *interest* of the film, of whether high or low Z-scores (high or low *interest*) are more frequent, or whether they are evenly distributed. For example, for *Ispansi!*, the overall interest profile is skewed toward low scores, suggesting that only a few sequences increased the overall level of interest. This pattern is also methodologically interesting because it also suggests that the participants discriminated among sequences and did not respond continuously but only when they considered that a particular sequence increased their interest level.

### **Interrater Reliability**

To check for consistency in interest scores, we calculated the interrater reliability by splitting the sample in half and correlating their mean scores for each scene. The Pearson's correlation coefficients for *Ispansi!* was  $\rho = 0.82$ ,  $p < 0.001$ , 95% CI (0.69, 0.90). The scatter plot in Figure 3 shows the split-half correlation for this movie, demonstrating a high degree of consistency across the split sample, which reflects good interrater reliability. To ensure that the reliability scores for the methods would be generalized to other movies, we also analyzed the data we collected for the two other movies. The Pearson's correlation coefficient values were  $\rho = 0.80$ ,  $p < 0.001$ , 95% CI (0.62, 0.89) for

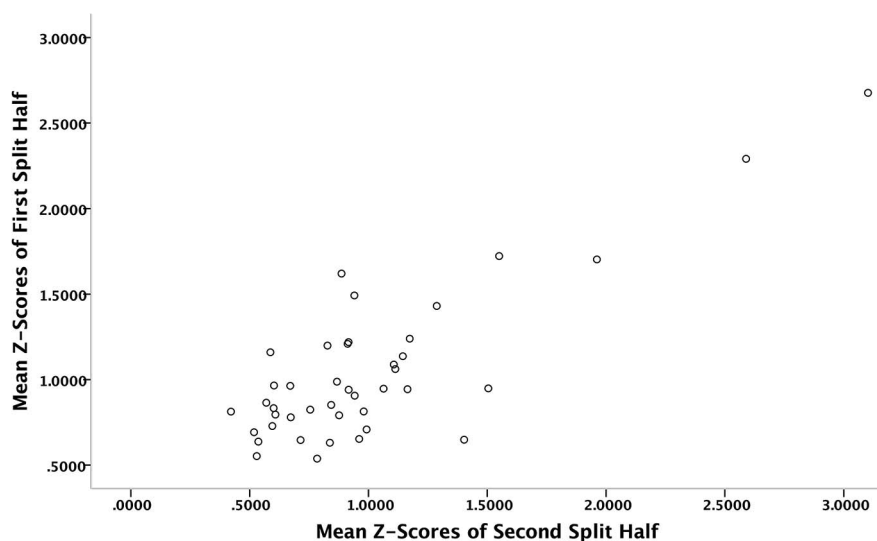


Figure 3. Scatter plots of the split-half correlation for *Isponsil* (Maestranza Films / Saga Productions / *Un Franco 14 Pesetas*).

the *Empire of the Sun* and  $\rho = 0.70, p < 0.001, 95\% \text{ CI } (0.50, 0.83)$  for *Mother of Mine*, which also indicate a high degree of consistency.

### Validity

To assess the validity of the measures, we analyzed the responses to the questionnaire (asking the participants to describe what aspect and/or sequence of the movie they liked best). Although some participants mentioned general aspects of the movie, others described specific scenes, enabling us to identify the scenes mentioned by most participants. Since we did not have a score for each scene (most scenes were never mentioned), we could not correlate this new measure with our interest scores from the subjective response mechanism. However, we were able to perform a qualitative analysis of the participants' responses. For all three movies, the sequences that were mentioned the most appeared at the end of the movie. We interpreted this pattern as being due to the fact that many of the more frequently rated sequences were shown at the end of the movie, indicating consistency between our voting scores and the questionnaire. The participants might also have tended to recall more recent sequences, since they were still fresh in their memories. If this was indeed the case, our subjective response mechanism might have an advantage over other methods that involve offline questionnaires because our system is less dependent on participants' memories. Similarly consistent with the results of the subjective response mechanism, the most frequently rated sequences in the middle of the movie were also mentioned in the participants' responses. Hence, although the responses to the questionnaire were not identical to the

results of the subjective response mechanism, their overall pattern provides some convergent validity to our measure.

### **Emotional Valence**

While the participants' overall responses indicated their overall interest, the subjective response mechanism also provided us with information about the emotional valence of particular sequences. The instructions asked the participants to use the subjective response mechanism when they thought that the movie was interesting, as well as to use one button to signal positive emotions (e.g., happiness, joy, experience of beauty) and the other button to signal a negative emotion (e.g., sadness, anger, disgust). The interest data can therefore be divided in order to disentangle whether the interest was accompanied by negative or positive valence emotions, and these analyses can be performed either when selecting particular sequences or studying overall profiles, as mentioned above. Although interest and valence are not totally independent, we have tried to assess them in the way that the two types of appraisals occur during normal viewing. However, we recognize that this might be a limitation of the present data and that further research should assess the influence of dual appraisal. For example, Figure 4 presents the distribution of votes per sequence as a function of whether they are positive (a) or negative (b) in valence for *Ispansi!*. The sequences with the highest number of votes (e.g., sequence 40) have both positive and negative elements, whereas others (e.g., sequence 20) elicit many more negative than positive feelings. This mixture in valence reflects that *interest* (novelty and complexity) comprises positive and negative elements combined in different proportions. This pattern favors our hypothesis that sequences that combined positive and negative emotional reactions in the viewers (complexity) would also be considered more interesting.

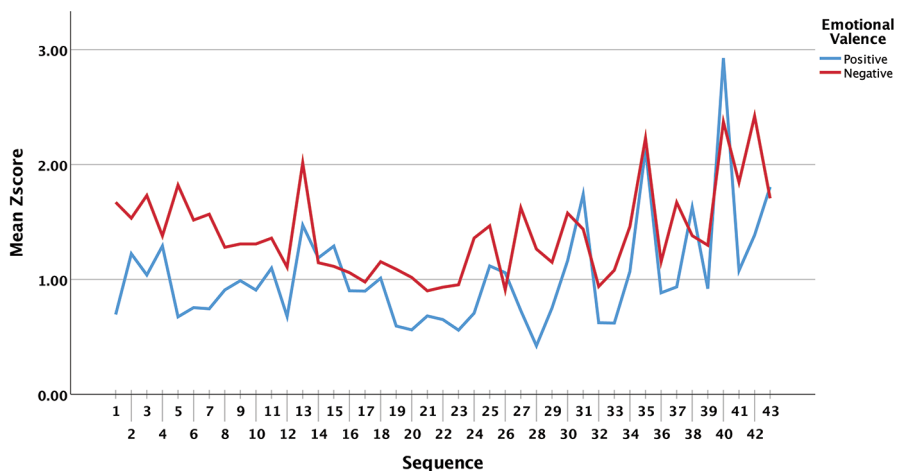
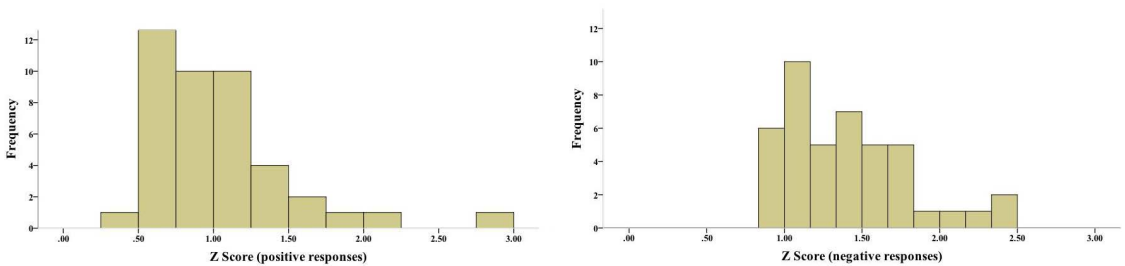


Figure 4. Distribution of positive and negative responses for *Ispansi!* (Maestranza Films / Saga Productions / *Un Franco 14 Pesetas*).

The frequency distributions of Z-scores for positive and negative valences also illustrate the emotional profile of the movie. Similar to *interest*, Z-scores for positive and negative emotions can also be calculated, and their frequency distribution would reflect the overall emotional profile of the film. For example, Panels A and B in Figure 5 represent valence distributions for *Ispansi!*. Although both distributions are skewed toward low values, there are more sequences with negative valence than with positive valence, which likely reflects the movie's overall negative emotional valence. These distributions are interesting, since they can be used not only to describe the overall emotional "tone" of a movie, but also to compare the emotional valence of different movies or different parts of a particular movie.



Figures 5a and 5b.  
Frequency distributions of positive and negative Z-scores for *Ispansi!* (Maestranza Films / Saga Productions / Un Franco 14 Pesetas).

### Analysis of Individual Sequences

An obvious application of this data is to identify sequences of high (or low) interest to the viewers for further study. Figure 1 clearly indicates which sequences the viewers considered interesting. For *Ispansi!*, the audience most frequently voted for sequence 40, which depicts one of the main characters' returns to Spain (after her odyssey in Russia during World War II) and the reunion with her brother. She belongs to a family that supported Franco's army, but in Russia she lives with Republican exiles. Thus, in the course of the film she changes her mind in several ways, and she comes to see both sides of the conflict. The siblings' dialogue turns into a debate about politics and the consequences of the war. The sequence also summarizes the plot of the whole movie.

In contrast, the audience considers sequence 19 the least interesting (as reflected by its low score), since it introduces a small detail in the plot (a secondary character suspects the main character of not being on the Republican side). This more qualitative analysis of the most- and the least-selected sequences based on their content seems to indicate that the voting method provides useful information on selecting sequences according to audience interest. Thus, when selecting sequences for experimental studies, this selection could be based on previous normative data on emotional reactions to the sequences. Similarly, the method could be used to select particular scenes based

on the viewers' levels of interest in them and to explore the composition, duration, and other features of the scenes and the shots in the selected sequences (see the next section for an example).

### **Further Analyses of Individual Sequences**

Because *interest* in a sequence seems to involve a mixture of positive and negative experiences, we analyzed individual sequences to see how these experiences were distributed across different shots. For example, we examined the distribution of votes across the different shots comprising the popular sequence 40 from *Ispansi!* (see Figure 1). Figure 6 presents the number of responses (votes) for each shot in sequence 40. As displayed in the figure, there are differences in the shots regarding the number of responses from the participants, suggesting that, within a sequence, not all shots have the same impact on the audience.

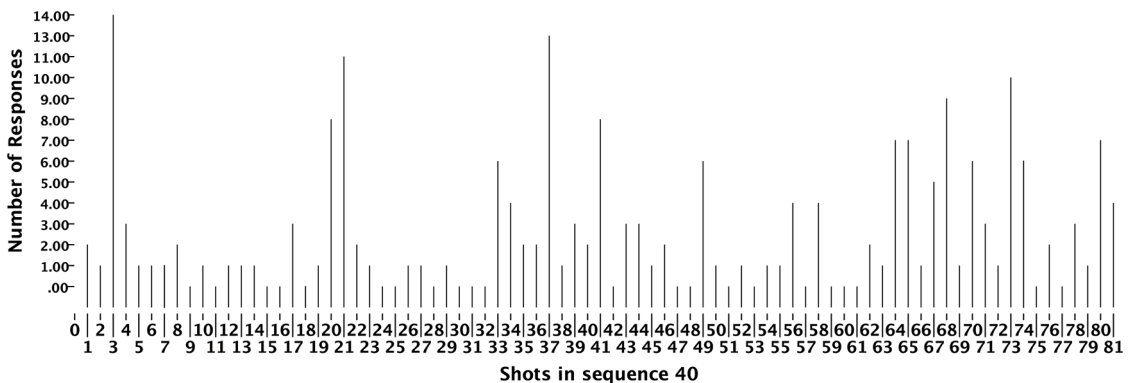


Figure 6. Number of responses for each shot in sequence 40 of *Ispansi!* (Mae-stranza Films / Saga Productions / Un Franco 14 Pesetas).

These quantitative analyses could be combined with the qualitative data on both the content of the shots and the participants' responses. To illustrate this possibility, we asked 16 participants who watched *Ispansi!* to view sequence 40 again and to verbalize their thoughts on what they considered interesting about the scene. The semi-structured interviews were transcribed, and the data was analyzed using content analysis as described by Robert Weber (1990). The approach to the content analysis was data-driven because it focused on identifying the sequence's elements and properties that aroused the audience's interest. The frequencies of the semantic units related to these elements were then recorded. Note that the following analysis was performed only as an illustration of the possibilities offered by the proposed method for film analysis. The selection of sequences should be driven by the research question; therefore, for some studies one sequence might suffice, but for others it might be better to select several sequences. Similarly, sequences might be selected in terms of *interest*, but *valence* can also be used as a criterion

for selection. We propose that the *interest* and the *valence* profiles obtained through the subjective response mechanism can be used as the bases for selecting sequences for further study. Even if researchers were interested in conducting studies with single sequences, the system can be useful as a way of selecting sequences from a film based on empirical data.

The content analysis of the participants' verbal protocols indicated that 14 participants considered scene 40 interesting. Four participants regarded this sequence as the most relevant and interesting "moment" of the film. In addition, we extracted the semantic units from the participants' verbalizations. We identified some elements of the sequences that could be categorized as *narrative* (verbalizations regarding story elements, including the plot, characters, dialogues, and historical moments, or evaluating the quality of the narrative features), *acting* (aspects of the actors' interpretations), *visual composition* (characterization, makeup, and settings), or *audio composition* (music and voiceover).

The results of the content analyses indicate that the audience's most relevant experiences regarding this scene referred to the narrative aspects. In total, 56 verbalizations pertained to different aspects of the plot, characters, dialogue, and so on, while 19 verbalizations referred to the plot of the sequence, two examples being "In this part is the outcome of the entire movie" and "The speech she makes here is the synthesis of everything that has happened in the film." Sixteen verbalizations were about the characters, such as "It reflects the change that the protagonist has undergone" and "The scene catches the [audience's] attention because when he sees the brother, there is not really any kind of affection." Eight verbalizations reflected opinions regarding the particular historical moment in Spain that the movie presents, for example "With the Spanish exile, too many people left" and "I am struck by the power that those of the blue division had at that time." Nine verbalizations indicated the importance of dialogue, such as "I like the conversation they have in that room because for the first time she says what she thinks" and "The dialogues are quite well elaborated." Seventeen verbalizations referred to the interpretations of the two actors and the actress, for instance, "The interpretation of the customs police is like, okay, there it is, there is the Iberico macho" and "The protagonist acts moderately decent." Finally, the numbers of verbalizations regarding visual composition (6) and audio composition (3) were much smaller and dealt with aspects of the setting, music, and so on.

This pattern of verbal responses is consistent with the pattern of participant votes for particular shots in the sequence. Figure 6 presents the shots with the highest rate, which tend to correspond to the narrative aspects that were mentioned in the verbalizations. For example, some of the shots with the most votes corresponded to the characters' dialogues in which they cited the portrayed historical period in Spain and the main character's changed political opinion after her war experience.

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The 3rd shot (with 14 responses) introduces the interrogation that Paula experiences on her return to Spain after her exile in Russia. She belongs to an aristocratic family, but because she had left Spain with members of the Republican side she is now suspected of being a communist. The customs police explain it to her.

In the 22nd shot (with 11 responses), Paula's brother uses his high position in the army to save her from any suspicion of treason. Happy to see her brother after many years, Paula tries to hug him, but he rejects her.

The 32nd shot (with 13 responses) is a transition shot that connects the full dialogue of the siblings, starting at the police station and finishing at their home. Paula's brother complains about his sister's clothes as a metaphor for her new "lefty" ideas.

In the 74th shot (with 10 responses), after an intense debate about the consequences of war and the events during that time, Paula's brother advises her that if she does not like Franco's regime, then she must leave the country to avoid the risk of being suspected of treason.

### **Discussion**

Traditional analyses of art have been highly intuitive with many discussions based on individual critics' experiences and preferences. Though traditional critics' points and ideas are supported by arguments, these are subjective in many cases. They may be quite pointed and relevant but do not communicate how ordinary people experience films. Indeed, it is often disputed whether popularity is a more important criterion for success than the acceptance of film critics (Gemser et al. 2007; Eliashberg and Shugan 1997; Pangarker and Smit 2013). In any case, the longevity of such discourse illustrates that audiences consist of diverse groups that experience films differently. Because films are not only forms of art but also products of technology, it makes sense to consider and investigate film viewing as a technological experience. In this article, we have illustrated how we can study films using traditional user-experience research methods. Our goal has been to shift from a subjectivist view of film to an objectivist and measurement-based analysis of experience and acceptance without limiting the analyses of the viewers' cognitive and emotional experiences to short clips or sequences.

Despite the growing interest in understanding the dimensions that produce emotional impact and interest among audiences, few studies have investigated the quantitative and the qualitative aspects of feature-length films. As mentioned above, film is difficult to study because any given film includes many narrative, visual, and auditory elements. Both the duration of feature-length movies and their complexity pose many challenges to researchers. This study has introduced a methodological approach to address the complexity of this audiovisual medium. Combining quantitative and qual-

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itative data in a flexible manner makes it possible to examine many aspects of feature-length films at both the macro (aspects of the full movie) and micro (aspects of individual sequences and shots) levels, as well as their effects on audiences.

Previous methodological approaches have tried to tackle the complexity of films by studying individual sequences. For example, most studies on visual perception in films have used short sequences and have examined eye movements and EEG recordings of brain responses to different perceptual features of the films (Häkkinen et al. 2010; Nie et al. 2011). Some researchers have focused on the visual compositions of the shots and how viewers perceive them (Proverbio et al. 2009). Tracking viewers' eye movements also makes it possible to assess why certain shots are more "visible" and easier to remember than others, as well as to identify the elements of the composition that remain "invisible" (Smith 2013). However, these approaches, if used on their own, miss the emotional content and the narrative complexity of feature-length films.

Other approaches have studied the structural aspects of full-length films by observing the frequency and the length of the shots. An example is Nick Redfern's (2015) exploratory research on four feature-length movies. The findings show highly similar characteristics of the shots, as well as the distribution of plot points and change plots that affect the moods of the narratives during the movies. Although these approaches have proven to be quite useful for studying individual aspects of films, our new method combines with others to provide a fuller view of different aspects of the viewers' processing of the films.

Undoubtedly, emotion and awareness are at the center of any great creative artifact that provides entertainment and information. Film watching that could evoke tears or laughter, make audiences reflect or desire something, or love or hate or sympathize with others is powerful because it can provide "edutainment" and associated emotional experiences, as well as arouse memories and feelings that reveal personal histories or future self-projections (Zillmann 1988). Planning successful films and other creative artifacts demands cultural and emotional awareness. Initially, creative scriptwriting has involved a great deal of fantasy by fabricating an emotional journey in a rather linear (or spiral) way. Often, the scriptwriters have to imagine each scene of the film plot to elicit the viewers' emotional responses. In addition, the director along with many other technicians and creators work on other film attributes (e.g., scenery, social context, montage, etc.) to create aesthetically pleasurable consumer products. In a sense, these attributes have to be technically and emotionally perfect to function as planned, but they also need a perceptive sense of the user experiences in each interactive encounter (Zillmann 1988).

In this sense, only the study of the triggered emotional responses when watching a film in real time really captures engaging user experiences. Hence,

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our study has aimed to use a method that facilitates assessing and analyzing which aspects and sequences of the film *interest* the viewers, as well as how these aspects affect their emotional experiences as the film unfolds in time. The subjective response mechanism has allowed us to unobtrusively identify the sequences perceived as *interesting* by the viewers. As expected, sequences that combined positive and negative emotional reactions in the viewers were considered as more interesting. But, more importantly here, our measurement did not require participants to recall parts of the film after watching it. Additionally, our use of questionnaires and open questions allowed us to qualitatively identify the reasons why some sequences generate more interest than others. These qualitative responses give meaning to the quantitative indexes (number responses) and reinforce the validity of our measure. Thus, many highly rated sequences are mentioned in response to the questions regarding the more interesting aspects and scenes of the movie. Similarly, the consistency of the responses across split-samples proves the interrater reliability of our measure. This aspect is important if a researcher intends to use the method to select sequences and scenes in the film for further study, since we want to ensure that participants from another (but similar) sample will also rate the selected sequences.

Combinations of quantitative and qualitative data also make it possible to observe the distribution of the audience's interest across the shots in individual sequences and to analyze the viewers' emotional responses in depth through semi-structured interviews. The content analysis of these interviews allows interpreting the voting preferences for the shots in the sequence and disentangling how various shot structures can elicit different emotional responses. Although in this article it was not our aim to study the relationship between sequence structure and emotional responses, we use our analysis of an individual scene to illustrate the types of analyses that can be performed using this methodology and the rich source of data that can be extracted from it. Interestingly, this analysis showed that a complex theoretical concept such as *interest* can be reliably measured, and that its structure can be studied by combining quantitative (positive and negative responses) and qualitative (content analyses) of the shots composing particular scenes.

While in this article we approach the problem from a fictional cinematography perspective, the same procedure can be applied to other types of audiovisual content. Both fiction and nonfiction (documentaries) feature-length films are typically watched in theaters or at home but with disruptive elements that can interrupt the narratives. However, TV shows and series commonly use other platforms to expand the experience and to allow real-time interactions with the audience (Neira 2015). Our subjective response mechanism allows a

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comparison of the impacts of different platforms on user experiences when used for TV shows and series. Platforms differ in many physical aspects of the display (e.g., size, resolution, audio components) that may change the viewers' preferences and emotional experiences in different sequences. Similarly, the method can be used to explore the effects of distracting elements in video products. Online videos are subject to many distracting elements that may change the emotional experience of the audience. Indeed, the large number of video products makes it difficult to hold audiences' attention. In this sense, our methodology could be an effective test before spending money and time on developing new content. The information generated by users will supplement our present results.

Finally, a film developed in a particular country and cultural context may not have the same impact on the viewers of another country or culture. Although it might be possible to find some features that users may generally consider usable and attractive, many factors are strongly influenced by cultural values (Ito and Nakakoji 1996). Likewise, audiences in the same country lead different lifestyles that influence their perceptions of a story and their experiences of audiovisual content. For example, viewers who have experienced the drama of exile may have a different emotional reaction to the movies used in the present study than viewers who have not been displaced. Individuals who have traveled to or lived in the countries featured in the movies may also have a different cognitive response and emotional experience when there are references to these places in the movies. Technology designers have recently started taking into account the rules and the customs that characterize different ways of life. Studies about audiences should do the same (Saariluoma and Leikas 2012). Our methodology and its associated tool provide ways to study different audiences and their various responses in real-time film watching. This technique can eventually help producers and creators optimize their scriptwriting design and film marketing and promotion strategies.

### **Limitations**

Despite its ability to address numerous questions, our method has several limitations. First, it mainly studies an audience's degree of *interest* in different elements of a film and its positive or negative reaction to these elements. Obviously, cognitive and emotional reactions to films are rather complex, and our study provides a simplistic view of them. Nonetheless, as mentioned above, our method can be adapted to capture other aesthetic emotions (being stirred or touched, inspired by beauty, having a pleasant experience) that are usually aroused by different elements of a film. Future research should broaden the focus to capture other variables that affect the audience's experience.

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Second, it was not easy to recruit participants for this study. The recruitment was conducted through social networks, street posters and billboards, and flyers that were distributed at the University of Granada and at various night entertainment venues. The event was announced as a free movie session, with free food and drinks included. This recruitment method was successful in that we had full registration for each planned session; however, only half of those registered showed up, and we needed to recruit more people and schedule more sessions. We consulted both the attendees and the non-attendees about the causes of the high dropout rate. The main reason was that watching three films in a day was too much, and the offer of food and drinks was not enough. When we compensated participants with 15 euros, the turnout rate increased to nearly 85 percent. Hence, our recommendation for similar future studies is to take into account the length of the sessions and plan an appropriate compensation strategy for participation.

Third, although the online subjective response mechanism using the buttons has proven to be an effective and accurate tool for our purposes, further refinement of the method is needed for future studies. As mentioned above, further research should explore both advantages and disadvantages of simultaneously assessing several appraisals. Moreover, the system of synchronization and later transformation of the data is still in a primitive phase, which makes the whole task of data gathering tedious and complex. When participants use the subjective response mechanism, it sends a signal to a portable device that saves the information as a time code in an Excel document. To analyze the data, we have to classify those time codes according to the respective scenes where they belong and later to the shots in the selected sequences. Our short-term objective is to schedule this task automatically and thus make it easier and more intuitive for researchers to work with the resultant database. Further work on data recording and synchronization should make the process faster and more automatic.

Finally, objectivist and methodological thinking should not necessarily contradict critics' intuitions. Film is a versatile and living phenomenon. Thus, it is vital to have as versatile an understanding of it as possible in different settings. Thus, a user-experience, research-based approach would strengthen the discourse, while universal moods and emotions refer to subjective states with experiential, cognitive, and sociocultural components. Similarly, as we mentioned in the introduction, no single method can address all the questions that can be raised regarding how people experience different aspects of films. Different questions may require different methodological approaches, but our subjective response mechanism combined with other quantitative or qualitative data seems to provide a useful tool with which to study feature-length films in the theatrical context.

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## **Appendix: Data sheet of *Ispansi!*.**

(Source: <https://www.filmaffinity.com/en/film939527.html>)

### **Original title**

*Ispansi! (¡Españoles!)*

### **Year of production**

2011

### **Running time**

115 min.

### **Country**

Spain

### **Director**

Carlos Iglesias

### **Screenwriter**

Carlos Iglesias

### **Music**

Mario de Benito

### **Cinematography**

Tote Trenas

### **Cast**

Esther Regina, Carlos Iglesias, Isabelle Stoffel, Eloisa Vargas, Bruto Pomeroy, Isabel Blanco

### **Producer**

Coproduction Spain–Switzerland; Maestranza Films / Saga Productions / Un Franco 14 Pesetas

### **Genre**

Drama | Spanish Civil War. Based on real facts. World War II.

### **Synopsis**

Shortly after the outbreak of the Spanish Civil War, the Republic sends 3,000 children to Russia to protect them from the bombing launched by the Nation-

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alists. The first to leave are the children in the orphanages. Beatriz, the daughter of a wealthy family of Rightists, whose father and brother are Falangists, becomes pregnant by a man who refuses to marry her and who decides to hide his son in an orphanage in Madrid. Upon learning of the child's imminent trip to Russia, she steals the identity documents of a dead Republican (Paula) and volunteers to care for the children. She thus embarks on a terrible journey, surrounded by enemies, and travels thousands of miles away from her country and her world. In June of 1941, Hitler invades Russia. The continuous arrival of troops for the defense of Moscow repeatedly obstructs the trip of the Spaniards. In one of these stops, Alvaro, a political commissar of the Communist Party of Spain, is united with them.

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