Assessing the Elderly's Emotional Responses while Interact with Movies Enriched with Additional Multimedia Content

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Abstract. The elderly population is faced with barriers when using new Information and Communication Technologies (ICT). These barriers include their low ability to read, as well as fears or lack of involvement with the media content. With the interactivity provided by the interactive Digital TV (iDTV), it is possible to attract greater interest among this audience. This paper provides data from a case study conducted to analyze the emotional responses of the elderly when interacting with a movie enriched with additional multimedia content. This content was added in excerpts with narrative structures that can trigger feelings of doubt or dissatisfaction and require reasoning or prior knowledge of the subject. The results suggest that the elderly prefer to watch TV more passively and without the intervention of other media. Considering the results a set of good practices and strategies was formulated for the design and of TV programs for this audience.

Keywords: Interactive Digital TV, Narrative Structures, Additional Multimedia Content, Emotional Responses, Elderly and Interaction Design.

1 Introduction

Television plays several roles in the lives of the elderly. It is probably their main source of information and entertainment. Some researchers believe the use of media and leisure have come to be almost indistinguishable in the daily lives of elderly people [1]. They have also suggested that television replaces lost social contacts for elderly viewers and helps them maintain an ongoing sense of participation in society and overcome feelings such as alienation and loneliness [1], [2], [3], [4]. However, this sense of participation and satisfaction provided by TV may be reduced if the viewer experiences physical and cognitive difficulties, which are typical of elderly people, such as the loss of hearing, vision or understanding of what is broadcasted [2], [5].

In the guide for the development of interactive TV services for elderly viewers, Carmichael [2] states that, to find an appropriate solution for the elderly, it is necessary to know this public and the difficulties experienced on account of their age. Important issues should be taken into account when designing interactive television services for these viewers.

In the context of interactive TV media, it is possible to offer additional content, with the purpose of displaying extra media information. This solution may provide the

viewer with a more valuable experience at the end of the TV session [6]. With regard to the elderly audience, interactive TV should provide them with an opportunity to extend the use of TV so that it includes similar activities to the Internet. The elderly can look for information, customize their viewing habits, carry out activities related to e-commerce (shopping, using banking services etc.) and interact with other viewers, by playing an increasingly active role [5].

In this study, additional multimedia content refers to extra information added to TV media in excerpts containing complex narrative structures with the aim of offering something more to the viewer, how to clarify, inform, criticize or make suggestions [6].

In a previous study, which appeared in HCII 2013 [5], we showed that additional content solution can assist the elderly viewer to be more closely engaged with iDTV. It can also help them to appreciate TV programs, especially by involving viewers in the media plot and making the TV experience more interactive and playful. The case study allowed evaluating the behavior of the elderly viewer after interactions with additional content previously added to a TV program. We investigated which additional media formats are more appropriate for the studied group. This previous study also included the formalization of some lessons learned and recommended good practices for the design of additional content for the elderly viewer [5].

This paper provides data from another observational case study conducted to analyze the emotional responses of elderly viewers - during and after the interaction - at this time to a movie that was enhanced with additional multimedia content. This content was added in excerpts including narrative structures that may induce feelings of doubt or dissatisfaction and require reasoning or prior knowledge about the subject. The results allowed a new set of good practices and strategies for the design and enhancement of TV programs for this audience.

The case study was conducted for eight months with elderly people from a Brazilian Reference Center for Social Assistance (CRAS in its Portuguese acronym). During this that period, the elderly group interacted with different devices such as tablets, smartphones, and printers. In two of these meetings, they were involved in activities with an interactive Digital TV. In this study eight elderly people were invited to watch a fourteen- minute long fiction movie. The emotional response of the audience was measured by means of the approach adopted by Xavier [7] and took account of three different methods and techniques.

This paper is structured as follows: Section 2 describes the main narrative structures used in film production and examines the inclusion of additional multimedia content in TV programs. Section 3 analyzes the observational case study conducted with the elderly audience. Section 4 discusses the results. Section 5 discusses some of the lessons that have been learned and investigates the question of good practices for the design of interactive additional content for elderly viewers. Section 6 summarizes the conclusions.

2   Narrative Structures and Additional Multimedia Content

For many people, including the elderly, the difficulties in monitoring a single medium often appear while the program is being shown and may be related to the content displayed. These situations occur because cinematographic art is formed of a complex

system of languages that are always difficult for the viewer to understand [8]. New technologies are also engendered in the media systems and configure another phase of this art. These changes require the viewer to have new cognitive skills to ensure a successful outcome from the narratives [8]. The way that someone receives and interprets a given message, in a given context, depends on issues related to the way this message was sent and his/her earlier experiences [8], [9].

The filmic narrative consists of a sequence of events. During this sequence, the characters move in a given space. The script of the narrative is based on action and this involves characters, time, space and conflict [8], [9]. The narrative structures that can be found in movies include metalinguistic resources that may require greater cognitive skills and lead to situations that appear confusing to the viewer. These structures mean that there is complex narrative thread. The most commonly used technical devices in filmic narratives are: a) a change of temporal plane (flashback or flash forward), b) intermittent cursor (e.g. music to create suspense in scenes of tension, filming techniques to highlight something) c) metalinguistic resources and hypermedia (direct citations, self-referencing, external references that require prior knowledge by the viewer to understand), d) linear and non-linear characters (the role played by the character is explained slowly and causes changes in the direction of the plot), e) metalanguage (using other languages to merge different kinds of information. These overlapping languages may derive from other media such as paintings, photographs and comic strips, for instance) [8]. These resources make the narratives and outcomes of these media more complex. Several cognitive competences are needed by the viewers to ensure a good outcome obtained from the entertainment products. These include intellectual skills; such as reasoning and logic, sensory skills; such as attention and perception, and social and creative skills [9]. We believe that, in some situations, the use of narrative structures may trigger feelings of doubt or dissatisfaction. The viewers may get lost at various times during the movie if they are not attentive or lack any related prior knowledge. In view of this, these authors propose the use of additional information to support the television viewers' experience at times when there are incidents in the narrative structures that prevent the movie from having a successful outcome. Studies on additional multimedia content point towards the need for ´static solutions´. Some authors combine interactive Digital TV with hypervideo. The additional information is combined with the objects shown in the scenes and hyperlinks are embedded in the video being transmitted. The viewer can access the additional information by selecting a point on an area of the image displayed [10].

Although it is a useful solution, it fails to take account of the need to support the different viewers' profiles and their specific features. It also overlooks some of the difficulties and the fact that, for example, when the elderly public uses new technologies, it often rejects them.

Carmichael [2] argues that when offering   products or interactive television services, the provider will have more chances to attract this audience if the service is combined with a menu (choice of options). Obrist et al. [4], however, warn that it is necessary to address the usability factors that are offered on screens as a set menu, because the elderly often encounter difficulties in using these interactive TV resources.

In light of these difficulties, designers and HCI professionals have the task of analyzing which features must be developed. This analysis must be carried out in

partnership with the final users so as to meet their requirements for interaction with the additional content available. There is also a need to determine how best to display and interact with the features so that they are not rejected and the interactive experience can provide pleasurable and satisfying moments.

In the context of this research, thought should be given to the question of a suitable design for the display of content, which must be flexible and allow additional multimedia content to be provided for different viewers' profiles, including the elderly. In the light of this scenario, this paper presents results from an observational case study conducted with eight elderly viewers. The practice allowed an evaluation to be conducted of the emotional responses of a particular sample of elderly people and some good practices and strategies were formulated for the design of additional content for this audience.

3   Observational Case Study

The case study conducted with elderly people evaluated some aspects of the way this audience interacts with movies and with the additional content offered in some excerpts from this media. The main purpose was to analyze the emotional responses of the elderly when they interact with movies which are created with the aim of making use of narrative structures that induce feelings such as doubt, confusion, tension, or dissatisfaction. Alternatively they may require from the viewer some type of reasoning and/or previous knowledge of the subject being addressed.

It is believed that interaction with these excerpts and narratives can influence and define the effects of the viewer´s emotional experience. If this impact is negative, it might make the viewer more hesitant about using TV and its new available resources.

The case study was conducted at a Reference Center for Social Assistance (CRAS) run by the City Hall of São Carlos-SP-Brazil. This center is frequented by an elderly group of people aged between 60 and 85, with an average monthly income of around $ 300.00, a low level of literacy and little experience in the use of technology. The elderly take part in physical, recreational and cultural activities. The aim of the partnership established between the researchers involved in this work, the City Hall and CRAS, as well as participating and collaborating with the existing physical, recreational and cultural activities, was to disseminate information about how the new ICT can be accessed and used, while taking account of the range of abilities and competences of the elderly population, as well as their manner of interacting with these technologies. As a result, the research and extension work conducted at CRAS provided for this public the access to devices such as smartphones, tablets and high-end TV sets with touch sensitivity.

The environment planned for the case study simulated a living room with a couch, a television set and remote control. The elderly group was invited to participate in an activity that consisted of watching a fiction movie that lasted for fourteen minutes. The eight elderly volunteers were divided into pairs in a way that took account of similarity in profiles, such as age group, level of schooling, physical mobility abilities and skills /experience in using a TV set. Two of the pairs formed a part of a "control group" and watched the film with no additional multimedia content, while the other

pairs formed a part of the "treatment group" and watched the same media enhanced with additional content on occasions when the narrative structure was thought to be complex. The additional content included media in text, audio or image formats.

3.1   Planning

Objectives of the Case Study: To analyze the degree of satisfaction of the elderly viewer when watching movies and observe whether this increases with programs that are enhanced with additional multimedia content in parts where the narrative structure is complex.

Hypothesis: It is believed that the elderly audience will obtain more satisfaction if they watch TV programs that are enhanced with explanatory additional content, which is made available on occasions when there might be doubts about the meaning. Alternatively, there might be additional content that can display relevant information.

Method and Prepared Questionnaires and Forms: A group of viewers was subjected to observation during a TV session to evaluate the emotional experience of the elderly viewers when they watch a movie with additional multimedia content. After the session, the group answered an evaluation questionnaire and took part in discussions to clarify significant points of the research. Some forms and questionnaires were prepared which included the following: a) a participant observation form, b) a SAM pictographic questionnaire (Self-Assessment Manikin) [11], c) a Brazilian protocol for research with Human Beings and, d) Authorization for Capture of Name, Image and Sound. The observation form supported the researchers in the analysis of the interactions and emotional reactions (gestures and facial expressions) and reported useful information about the viewers during the session.

Media: The media employed in the study was approximately fourteen minutes long and its genre was fiction. The choice of the media took into consideration information that had been collected from a profile questionnaire which had been given to this group of elderly people at the beginning of the project. The researchers sought for media that would arouse the interest of the audience, with a length of time that was compatible with the period they spent doing CRAS activities. It comprised excerpts of narrative structures that might cause doubt, misunderstanding or dissatisfaction, or excerpts that required some previous knowledge from the viewer. The elderly from the treatment group watched the movie which had been enhanced by three additional content. The first was included in textual format and contextualized a flashback scene. The second was in the format of text followed by an image and was incorporated in a scene with an external reference that required the viewer to have previous knowledge. The third was also included in a scene with an external reference; it was in audio format and supplied useful information for clarifying the context. The additional content were shown in parts of the movie when there was no speaking so as to avoid the loss of the main audio content. The added information was shown at the same time as the movie, and did not allow the video to be stopped so that the additional multimedia material could be enjoyed.

Interactivity Icon: In the ten seconds that showed the additional content before, an icon that indicated its presence was displayed in the upper right-hand corner of the

TV screen where it remained for five seconds. The screen on which the media was shown was 21.5 inches in size and the action icon for the additional content was a static interface feature occupying approximately 3% of the screen.

Figure 1 (a) illustrates one of the additional contents that has been included with image and text formats, Figure 1 (b) illustrates the screen showing the interactivity icon and, Figure 1 (c) shows the elderly viewers participating in the TV session.

Fig. 1. a) Additional content added to the Textual and Image formats; b) Interactivity icon displayed in the displayed media; c) Elderly viewers participating in the TV session

3.2   Interaction with the Movie

In this stage, the pairs were invited to watch the movie, one at a time. At the beginning of the session, the viewers were informed of how the session was going to be conducted and that they were free to leave it at any time.

The elderly could interact with each other during the session. At the same time, the researchers analyzed the viewers in accordance with the ´Brazilian protocol for research with Human Beings´, and filled out the observation form that involved describing the gestures and expressions that arose during the session. The images of the viewers' faces and bodies were captured during the session for subsequent evaluation.

In the second period, at the end of the movie session, each viewer filled out the SAM form and took part in a discussion in which they were questioned about the experience they had undergone in the session. The discussion was conducted with the aim of obtaining, (in the most spontaneous manner possible), information about the feelings experienced during the movie. The discussion was also designed to obtain information that could allow an evaluation to be carried out of on the displayed interface solution (for the "treatment group" – movie with additional content).

3.3   Methodology for Assessing the Collected Data

The hybrid approach adopted by Xavier [7] was employed to evaluate the data collected during the TV session. The approach is used for the evaluation of the emotions of users when they interact with information systems. On the basis of the experiments, the authors found that, when used in an isolated manner, approaches for emotional evaluation may yield imprecise results. To overcome this problem, Xavier combined methods and assessment tools that exist in the literature. The approach takes into account different stakeholders such as users and experts, in addition to using data collected at different times of the evaluation, and involving interaction before, during and after the interaction.

The Xavier's approach is based on the semantic model for emotions proposed by Scherer [12]. The model is composed of a structure in a circular format that categorizes distinct emotions through the staggering of four main hemispheres: Valence, Arousal, Goal Conduciveness and Coping Potential. When an evaluation is conducted with users, this model takes account of the observation of components such as physiological responses, subjective feelings, cognitive appraisal, behavioral tendencies and motor expression. Xavier [7] determines a set of methods and tools for each component, which can be used to collect information.

Only three of these components were evaluated in this case study, which are: subjective feelings, motor expression and cognitive appraisal. These components were chosen because they are the most closely related to satisfaction, which is the focal point of our research. Among the assessment tools listed by Xavier [7], we have adopted: the SAM [11] questionnaire to evaluate subjective feelings; Discourse Analysis of Collective Subject (ADSC in Portuguese) [13] for cognitive appraisal and, analysis of Emotion Heuristics [14] to evaluate motor expression.

SAM [11] is an evaluation method that uses pictograms and addresses issues relating to the affective quality of a computing system. With SAM, it is possible to evaluate three dimensions of a person when using a computer system: Pleasure, Arousal and Dominance. The SAM questionnaire used in this study evaluated two affective dimensions: pleasure and arousal, which are categorized in this research as ´satisfaction´ and ´motivation´, respectively.

The ADSC method allows a qualitative analysis to be conducted of the user's discourse and is evaluated on the basis of the number of occurrences of keywords in the user's speech during the interaction. After establishing the keywords, these are evaluated for similarity of meaning [13]. In this study, the discourse analysis was used to evaluate the filming, the data collected from observation and the semi-structured interviews.

A set of twenty-three emotion heuristics was used to analyze the motor expression and these represent the viewer's behavioral patterns when interacting with TV programs or movies. These heuristics are called TV Emotion Heuristics (TVEH) [14] and allow a comprehensive assessment of the emotional response of the viewers. Some of the TV Emotion Heuristics are as follows: Restless feet and/or legs, Physical Adjustments, Shaking one´s head, Moving one´s hands, Crying, Breathing deeply, Sleeping/dozing off/yawning, Watching everything in a scene or paying attention, Brow Raising, Gazing away, Smiling, Hand Touching the face. The heuristics observation was carried out based on a video with the capture the user's interactions. The heuristics can be classified as Positive, Negative or Neutral. However, if the evaluator does not feel the urge to make a characterization, or has doubts that the occurrence of that heuristic cannot be directly related to the media on display, he/she should use the 'Nothing Can Be Concluded'. Therefore, the user experience and the feelings associated with this experience should be defined based on an interaction scenario and interventions arising from them.

The video, that lasts approximately 50 minutes and contains images collected in the case study with the elderly from CRAS, underwent a heuristic evaluation of five evaluators, following the Molich and Nielsen [15] recommendations for heuristic evaluation. One of them was considered to be inexperienced, three had little experience and one of them was an expert in the method. The classification of the experience took into account

the number of times that the evaluators applied the heuristic evaluation of emotions. Thus, the following classification was considered: above 5 applications: expert evaluator; 2-5 applications: evaluator with little experience; 0-1: inexperienced evaluator.

The application of the hybrid proposal proposed by Xavier [7] allows the specialist to infer if an information system is capable of eliciting a positive, neutral or negative emotional response in the users. The approach is divided into three stages: 1) Selecting Measures, 2) Generalization of Results and, 3) Incidence Octants.

In the *Selecting Measures* stage, the designer has to identify what measures will be used to evaluate the user's experience. In this case study, as mentioned earlier, the components evaluated were subjective feelings, motor expression and cognitive appraisals.

Table 1 illustrates the hybrid proposal in Stage 1 and for each of the three components used, describes which were the assessment methods adopted, the moment that this evaluation was carried out and who was responsible for the final decision when the evaluation of each component was conducted.

Table 1. Instantiation of the Selecting Measures stage

Emotion Component	Method and Domain Evaluated	Moment	Responsible Evaluator
Subjective Feeling	SAM –> *Satisfaction Domain*	Post-interaction	User
	SAM –> *Motivation Domain*	Post-interaction	User
Motor Expression	Emotion Heuristic + Observation –> *Satisfaction Domain*	Post-interaction and During the interaction	Specialist Group
Cognitive Appraisal	Interview (ADSC) + Observation –> *Motivation Domain*	Post-interaction and During the interaction	Specialist

In the *Generalization of Results* stage, each of the measures collected has its result evaluated individually and, for each measure employed, the designer must generalize the collected results in positive, neutral or negative terms. In the sequence, it is necessary to relate each result to the respective hemisphere (four octants) and consider the positive and negative side of each domain. According to Xavier [7], neutral results are not related in the octants of the semantic emotional space [12].

To carry out the *Incidence Octants*, the specialist must increment the octants of the semantic model on the basis of the results of the evaluated measures. The results obtained from the application of Stages 1 and 2 are described in the next section.

4   Results

The results obtained from each method and emotion component, that take account of the control groups (CG) and treatment group (TG), are summarized in Table 2. In this stage each elderly person had his/her experience evaluated as positive (+), negative (-) or neutral (0).

In Stage 2, the results computed for each method are generalized. In Stage 3, the octants incidence is evaluated. The designer must relate each positive or negative result to the respective hemisphere which is considered to be a positive or negative domain evaluated by the measure. In this instantiation, only two domains were evaluated: Satisfaction and Motivation.

Table 2. Evaluation of the elderly people´s (E) emotional experience

Emotion Component	Method	Evaluation (Positive +, Negative - , Neutral 0)
Subjective Feeling	**TG**: SAM - Satisfaction	E1= + E2 = + / E5 = + E6 = +
	CG: SAM - Satisfaction	E3 = + E4 = + / E7 = + E8 = +
	TG: SAM - Motivation	E1 = + E2 = + / E5 = + E6 = +
	CG: SAM - Motivation	E3 = + E4 = + / E7 = - E8 = +
Motor Expression	**TG**: Emotion Heuristic	E1 = - E2 = - / E5 = 0 E6 = -
	CG: Emotion Heuristic	E3 = + E4 = + / E7 = 0 E8 = +
Cognitive Appraisal	**TG**: Observation + Interview	E1 = + E2 = + / E5 = - E6 = -
	CG: Observation + Interview	E3 = + E4 = + / E7 = 0 E8 = +

When carrying out the incidence process in the octants, the specialist must compute how often a given octant was determined by the results of the measures adopted. The hemispheres related to the domains of Motivation and Satisfaction are north/south, east/west, respectively.

Taken as a basis the results shown in Table 2, Figure 2 illustrates the application of Stages 2 and 3 of the hybrid approach for each viewer, and also takes account of the partial and total evaluation of the groups for each domain evaluated. In accordance with the hybrid approach, the neutral results are not related to the octants of the emotional semantic space. Figure 2 (a) illustrates the results for the treatment group and (b) refers to the control group. The elderly people represented by number 1, for example, had positive results when viewed in the motivation domain evaluated by SAM, interview (ADSC) and observation (Table 1). The two measures are generalized in the respective hemispheres. This procedure is carried out for all the elderly and for all results of the applied methods. After the partial results have been obtained, these measures are added and represented in another hemisphere (Final Evaluation).

By means of the octants incidence process is possible to verify that the end result of the emotional responses for the control group (CG) coincides with the responses for the treatment group (TG). In both groups the emotional responses were concentrated in octant 7/8 (as illustrated in Figure2).
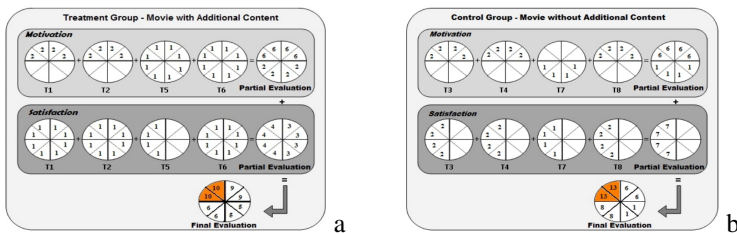
Fig. 2. Octants Incidence: a) for TG group and, b) for CG group

According to the hybrid approach and Scherer's semantic space [12], emotions concentrated in this octant suggest a positive experience. For the satisfaction domain, it can be understood that the viewers felt satisfied and had a pleasurable experience. In the case of the motivation domain, the indications are that they were interested and

enthusiastic. This evidence can be confirmed in statements from viewers: "I found it very cool and funny", "Very interesting". However, with regard to the hypothesis that the elderly public might feel more satisfied when watching movies enhanced with additional content, the results point to the rejection of this hypothesis. These results corroborate those of previous research studies [5] and suggest that this profile of elderly viewer prefers to watch TV more passively, without the need for any kind of interaction, effort or intervention from other media on the main media. Given this information, it is necessary to reevaluate the purpose of offering interactive and additional content to this audience, because it is possible that this audience just wants to obtain the information and has no interest or inclination to interact with it.

5   Lessons Learned and Good Practices for the Design

The case study provided us evidence that elderly viewers constitute an audience with particular needs, which are not only physical but also 'affect-cognitive'. If they want the TV content to be more interesting for this audience, especially for the elderly with profiles similar to those studies here, the producers of this 'content' must think of new strategies and the possibility of offering more flexible content and interface solutions.

As regards the physical and emotional characteristics of the elderly in the interaction with additional content, there are a number of strategies that arise from our studies with this audience (and are also based on the literature) which include the following:

- Providing familiar interface element which do not require memorization and which might be more intuitive;
- Providing flexible and adaptive interfaces to define the profile of elderly viewers and their preferences. The likelihood of the elderly wanting to interact with the content might be higher if the provision of content took account of the pre-defined profile;
- Helping them to understand the new paradigm and the new possibilities it opens up by offering a playful and attractive design;
- Offering only what is needed at that time and also, if possible, respecting the preferences indicated. A great deal of information and opportunities for interaction may leave the elderly viewer bewildered and lost;
- Additional content, which is very important as a form of information, as a public utility or is related to health, might be provided in a compulsory mode. This strategy should be used for situations in which it is very necessary to ensure that the information reaches the elderly.

With regard to the interface features for interactive TV programs, it was possible to formulate some good practices which could be employed in the design of the interaction with additional content for the elderly viewer. These good practices supplement those that were initially proposed as a result of the first meeting with the elderly group [5], as well as supporting the practices described by Carmichael [2]. They also take into consideration some factors that arose from the study carried out by Obrist et al, [4]. These good practices are as follows:

- The interactivity icon should be attractive, preferably animated, larger than 3% of the display screen and available at the top left-hand corner of the screen (respecting the natural reading orientation for Western viewers);
- The way of displaying the additional textual content, for these viewers, must be different from that proposed by the Brazilian regulatory agencies [16]. It is suggested that the content with subtitles is displayed on the upper part of the screen because the visual exploration of the underside part of the screen only happens on a second occasion [4];
- The elderly may not associate the interactivity icon (interface element) on the TV screen with the same color button on the remote control. We should seek to overcome this problem to that does not require memorization or association with colors. One alternative is to define a single button on the remote control that can activate the interactions;
- In the design of the interface, (apart from considering a study about size and the disposition of text fonts), account should also be taken of a study about colors and contrast. A white font on a yellow background is not advisable. White fonts on a black background are preferable for a configuration format that allows more effective reading [16].

The profile of the elderly that has been studied here reveals that they adopt a more passive posture while watching TV. This characteristic may result from different influences ranging from low literacy and little experience with technology to characteristics related to ´affect-cognitive´ issues. The implementation of these practices is expected to reduce the effects on this audience resulting from their rejection of the more interactive contents, and allow them to enjoy the interactivity services provided, as well as enabling them to appreciate TV programs such as movies and give them live positive experiences.

6   Conclusion

The data collected from the study provide evidence that there is a demand for interface features that are more flexible and better suited to the needs of the elderly. These features also make it necessary to take account of the physical and emotional characteristics of the elderly viewer when designing interactive interfaces. The study also revealed that the elderly viewers from the studied sample seem not to mind the presence of complex narrative structures in the media. As they adopted a more passive posture during the session, many of these structures are not identified, understood or absorbed in the context of movies. The same occurs when there is additional content included. The results of the data collected from the application of the hybrid approach suggest that there is no difference in the emotional responses between the ´control´ and ´treatment´ groups that were produced by either the presence of narrative structures or the additional content supporting them. However, these results only take account of the profile of one particular viewer. Elderly people with a higher degree of literacy and who are users of new ICTs may show a more active posture and interact in a different manner with interactive TV content. Nevertheless, these assumptions require further study before they can be corroborated. We believe in immersing elderly viewers in new forms of communication. Moreover, there is a widespread belief that it is possible to digitally include these people by making them undergo experiences provided by the new ICTs, by making use of services without leaving home and enjoying pleasurable moments in the company of good TV programs.

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