COMPETITIVENESS AND INNOVATION FRAMEWORK PROGRAMME

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1 Executive Summary

This report covers the first twelve months' work on the planning and implementation of the Pilot of Mature Digital Television Access Services in four countries undertaken as part of the DTV4All project between 1 October 2008 and 30 September 2009. This report represents part two of a set of three reports. Its main aim is to outline the work done to this point and to comment on any interim findings. The first report D2.3 reflected primarily on the planning and preparation that was required to initiate the pilot. The third report will incorporate a review of the full and final test results.

Section 2 of the report outlines the issues that highlight the need for the Pilot including:

- Inadequate statistics on the current access services provision in the 27 EU member states
- Low awareness of e-inclusiveness issues throughout the value chain of digital television
- Gaps in the current knowledge of the efficacy of existing access services
- The diversity of circumstances across Europe making it necessary to offer a range of access service solutions
- Changing priorities among key stakeholders including special interest groups representing those with physical and cognitive impairments
- The impact of the economic downturn on access service provision

Section 3 focuses on the work done in the period to 30 September 2009. Significant progress has been made by the project partners across the board and this report breaks down the progress on a per partner basis. Progress is reported against the following partners Danmarks Radio /Danish Broadcasting Corporation (DR), Rundfunk Berlin-Brandenburg (RBB), Televisió de Catalunya (TV3) as well as the participating universities, although at this interim point the report limits itself to progress and results in two of the universities participating in the pilot, specifically Universitat Autònoma de Barcelona and University of Roehampton, as work is ongoing in the other participating universities. The full and final analysis of results will be presented in the final report.

Section 4 outlines the interim results of the work to date including some specific findings of the partners.

Section 5 draws on the interim findings to highlight some key interim conclusions. Including:

- For accessibility purposes a difference must be drawn between subtitling countries and dubbing countries
- Though the quality and accuracy of this type of subtitling is still to be improved subtitling by respeaking has proven to be a potent tool towards accessibility. One recommendation will be to create a pool of European languages SR software in order to promote 100% subtitling.
- The delay associated with Live Subtitling is a significant challenge.
- In most cases users, subtitling preferences are heavily influenced by habit. However after being influenced by alternatives (in placement, for example), as part of the tests, they change their minds. Interim results reveal clear differences between pre and post-test user preferences based on questionnaires administered by UAB.

2 Introduction

2.1 The aims of this report

The vision underpinning DTV4All is one of e-inclusiveness. It is about a Europe in the not-too-distant future where as many Europeans as possible are able to access digital television.

Access services for digital television are already available in many EU member states. DTV4All operates at the policy level and aims to identify measures to accelerate e-inclusiveness.

To improve the e-inclusiveness of digital television, action is required on three fronts:

1. In the short term, facilitating the take-up of mature access services on what the project team has termed first generation digital television. This will be operational over the timeframe 1997-2012 and is concerned with broadcast systems based on MPEG2 technology.
2. Preparing for the second generation of digital television by assessing the viability of mature services on second generation digital television platforms.
3. Identifying and validating emerging solutions that will either replace mature access services, or extend the scope of access service provision, on second generation digital television platforms.

This report covers the Pilot of Mature Access Services (WP2) and will contribute inputs to the first two action points.

A legitimate reaction to the notion of a Pilot of mature access services that has been noted several times by the project team since the project started is: "If the access services are mature, isn't a pilot of them superfluous? As we know what is needed, isn't it just a question of getting started?"

What the work of the first 12 months of the DTV4All project has shown is that a Pilot *was* needed because:

- *The baseline for measuring success in increasing the roll out of access services on digital television is ill-defined* – adequate statistics are not available to establish what access services for digital television are currently offered in the 27 EU member states and the rate at which these services are being extended. Working with the European Broadcasting Union (EBU), the project has put in place a mechanism for an annual survey of EBU members so that comprehensive and up-to-date figures on what is being done will be available.
- *Low awareness* - knowledge of the access problems across Europe, their causes and potential solutions is patchy throughout the value chain of digital television. Even in states where there is a good offering of services like Audio Description, many of those who would benefit from them are unaware of their existence.
- *Gaps in knowledge of the efficacy of existing access services* – far too little is known about: user needs and preferences when it comes to the presentation of DVB-Subtitles, if and how users with varying hearing capabilities actually use pre-recorded and live subtitles.
- *One size does not fit all* – Europe is a culturally diverse continent where different access solutions have emerged in response to diversity. A good example is inter-

lingual communication, i.e., making TV programmes in a foreign language accessible to viewers. Parts of Europe, such as the Nordic region and Benelux, have more than fifty years' experience of providing inter-lingual subtitles whereas most of the rest of Europe uses dubbing or lectoring. The role and perception of intra-lingual subtitles as an aid to those with a hearing impediment is clearly different in, say, Denmark where everyone is used to subtitles for inter-lingual communication and Germany, where subtitles are unfamiliar and are almost exclusively associated with hearing impediments. The DTV4All has to keep this diversity in mind and offer a strategic toolkit for access service implementation that is sensitive to cultural diversity and national circumstances.

- *Stakeholder perceptions of priorities are evolving* – when work started on proposal for the DTV4All project the consortium members were familiar with the priorities of the special interest groups representing those with physical and cognitive impairments but since mid-2008 changes have been noted in these priorities. An example of this is the interest in Spoken Subtitles as a complement to Audio Description. Feedback from the UK and Denmark indicates an increased interest in scaling up services for those with visual impairments in the direction of spoken subtitles for non-fiction and AD for TV fiction and drama.
- *The economic downturn and the need for more efficient workflows* – although producing access services accounts for a relatively small part of television production budgets, in the current economic climate there is pressure from within the organisations delivering digital television services to improve the efficiency of workflows and playout systems associated with access service provision and to contain their costs at a time where particularly those dependent on advertising revenue are struggling to make ends meet.

The Pilot has had to be responsive to the above issues.

In this report the DTVAll project team aims to explain the following:

- what work was planned by:
    - The broadcaster partners in the project
    - The universities contributing to the work of the project
- what work has been done to date and the rationale for any changes or additions to the plan for the pilot since 1 July 2008
- what interim findings have been made
- which interim conclusions have emerged
    - how these can be incorporated into later outputs of the DTV4All project that can have a strategic impact on the efficiency and effectiveness of access service provision in the short term

2.2 Who this report is aimed at

- The DTV4All project partners
- The European Commission
- Other interested stakeholders

2.3 How to read this report

The *Executive Summary* contains a resume of work on the pilot from 1 July to 30 September 2009.

Section 2 describes the issues which necessitated the pilot.

Section 3 describes the **work completed** by 30 September 2009 in the four countries. In the case of TV3 this report contains additional background information that aids the understanding the processes within TV3.

Section 4 gives the **Interim Results** of the Pilot. With regards to the universities' tests to date the results of the University Autònoma de Barcelona are included in some detail.

Section 5 includes **Interim Conclusions** from the first twelve months of the Pilot.

Section 6 discusses an example of **Outreach Activities** to the users' associations.

Sections 7 is an **appendix** that incorporates the TV3 Audio Description Questionnaire.

3 What has been done to date

3.1 Broadcasters and the mature access services evaluated

3.1.1 DR Progress

AD evaluation

As was originally planned and outlined in D2.3 a round of consultations was completed, leading to the conclusion that there is interest in increasing the proportion of programming for which there are access services for the visually impaired, even if this means introducing audio subtitles at the expense of AD, if this would lead to an increase in service coverage.

Live-subtitling

Work until the end of September 2009 has concentrated on the following:

i. Putting together the sample user group with the aid of a partner with the necessary background data in order to assure that the sample is broadly representative of Danish users with hearing impairments
ii. Developing and validating a holistic tool to conduct user tests.
iii. Developing and validating the test procedures.
iv. Selecting personnel to carry out the audience research on live subtitles.
v. Conducting tests on live subtitles used in conjunction with a 25-minute news programme. The sample was 29 subjects with a range of functional impairments and ranging in age from 40 to 98.
vi. Doing provisional analyses of user perceptions of live intralingual subtitles compared with pre-recorded inter- and intralingual subtitles
vii. Linking this work with dissemination activities to ensure a multiplier effect across Europe.
viii. Arranging for the results to be fed into ongoing standardisation work on digital television in the Nordic region.

As of 1 October 2009, the following was completed:

Re. (i) A sample of 30 subjects with a range of hearing, visual, locomotion and cognitive impairments was put together in collaboration with the Centre for Special Education of Adults. The sample was skewed to include 15 subjects in the 60+ age group to ensure the representation of some of the most vulnerable groups who are dependent on television for their news.

Re (ii) A software tool was developed by Nordija using open source Java tools which runs on Windows (XP, 7, but NOT Vista) and Macintosh System X. It was fully operational by the end of August 2009.

Re. (iii) 4 test persons were used to validate the methodology of the exploratory study which was completed by July 2009. The details of the procedures were vetted by Sofie Scheutz, head of qualitative research at DR

Re. (iv) two graduate researchers with experience in usability testing (Anni Randers, Marguerite Johnson) carried out the tests under the supervision of Peter Olaf Looms. Marguerite has additional relevant experience in that she has a hearing impediment in both ears and is a regular user of audio link when watching television.

Re. (v) Tests on 29 of the 30 subjects were conducted from 24 August to 1 October 2009, predominantly in the laboratory living room environment for focus group tests at DR Byen in Copenhagen.

Re (vi) The preliminary results compare the incidence of reactions in the form of buzzes from subjects during three types of news items:

- Pre-recorded intra- and interlingual news items with subtitles
- Pre-produced subtitles (intra-lingual) that are played out live in connection with scripted studio intros and outros
- Live intralingual subtitles produced by respeaking and which appear with a delay of approximately 7 seconds in relation to the speech to which they refer.

Live subtitles account for 23% of the total news programme. The zero hypothesis is based on the different kinds of news items being essentially the same in the minds of the viewers. If this were the case, there should be a correlation between the proportion of buzzes in each type of news item and the proportion of time for the three categories.
The study showed that there were significantly more buzzes in news items with live subtitles than in items with pre-recorded and pre-produced subtitles.
It was anticipated that there could be three main categories of problems associated with news items with live subtitles:

- Problems caused by semantic errors in the respeaking software (there were two such errors in the three items used)
- Problems caused by differences in presentation (live subtitles are displayed using "roll-ons", i.e. a few words at a time. Pre-recorded subtitles are displayed as "pop-ons" with 2-3 lines changing at a time.
- Problems caused by an increased cognitive load caused by having both to listen to the audio and read subtitles displayed with a delay of 7 seconds.

Re vii, dissemination, the study was discussed with other broadcasters at the EBU Seminar on subtitling in Lucerne on 8 May 2009 and with the EBU on the IBC stand in Amsterdam.
Re. Viii, the results are being written up so that they can be submitted to standardisation bodies such as NORDIG and those responsible for the Microsoft Media Centre with the aim of introducing a solid state buffer in Personal Video Recorders allowing users to "re-synch" live subtitles. This also requires the use of a flag in DVB-SI to indicate when live subtitles are being transmitted. This should take place in November, 2009.

- With the EBU, the drafts were reviewed in detail and corrective action was taken.

3.1.2 RBB Progress

The original plan was that RBB wanted to test both DVB-Subtitles and Clean Audio technology from January to December 2009 with a user group of 50 hearing impaired and deaf users. This plan as described in Chapter 3.1.2 of Deliverable D2.3 has been broadly adhered to.

The only two deviations to date are:

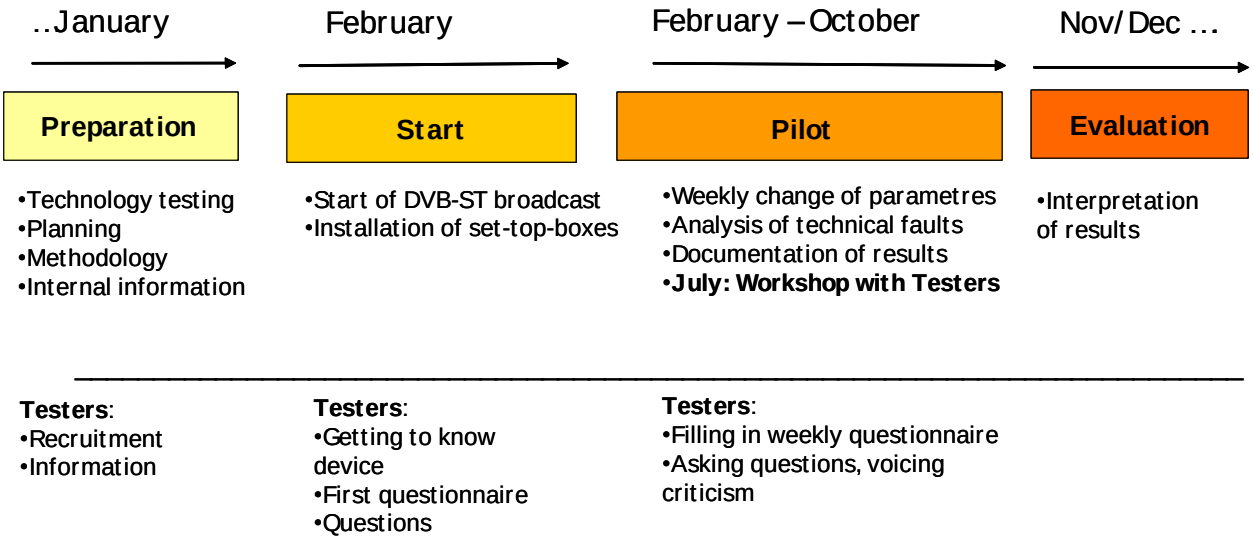
1. The DVB-subtitle test started with a one month delay: Test week one started on 23 February 2009.

2. As has been detailed already in a number of documents, Clean Audio is not yet a mature technology. Once this became clear in the context of cooperating with IRT, it was decided to deal with that technology in the framework of WP3 rather than WP2. (Please see Chapter 6 of Deliverable D3.2 for an overview, especially concerning IRT's development work on Clean Audio in DTV4All). As mature technology in DTV4All is tested in field tests with live broadcasting services, the original plan was to broadcast an extra audio channel with a "clean audio" service. Instead, it was decided to provide a DVD to testers in Mid-November 2009 so the original time plan still stands. The DVD provides different audio samples and the testers have three weeks to conduct the accompanying test at home. In addition, two clean audio "pre-tests" were conducted, one in May and one in October 2009. Here, first three then five people tested different audio samples at home with a DVD prepared by IRT and RBB. All this will be elaborated in the respective WP3 deliverables.

However, the connection to WP2 lies in the fact that the testers for the clean audio test are being recruited from the large test group of RBB's DVB-subtitle testers. In October 2009, the hard of hearing persons in this test group who had already received an announcement of the clean audio tests in January 2009, at the very start of the DVB-subtitle tests, will receive an invitation to participate in the clean audio test via DVD. The testers agreeing to participate will be provided with a DVD player by RBB.

Detailed Pilot Overview

This figure provides an overview of the RBB DVB-subtitling pilot in 2009.



DVB-Subtitling – Activities from 1 April 2009 to 30 September2009 (Reporting period covered by this deliverable)

As to DVB-Subtitles the original plan was realised. As described in Deliverable D2.3, the DVB-subtitle test started with one month delay: Test week one started on 23 February 2009. In its DVB-subtitle tests RBB wants to find out the optimal design from the end user point of view while also considering questions of technical feasibility. Testers receive a weekly questionnaire according to their communication preferences either via post, mail or fax to evaluate DVB-subtitle design variations. As described in Deliverable D2.3 where the RBB test methodology is covered in detail, one or two parameters of the subtitle design were changed by RBB on a weekly basis (font size, font type, appearance/layout like text only with a border/outline, a box / black or with different grades of transparency etc.). The following table shows the parameters that were tested in the reporting period.

Parameters Tested in the reporting period

Test weeks of the reporting period are black (highlighted)					
Test week	Type of Font	Small	Aver.	Large	Layout (Background)
1	Arial	32			Box longest Line, Transparency 0
2	Arial		40		Box longest Line, Transparency 160
3	Arial			44	Box, Transparency 160
4	Arial		40		Box, Transparency 120
5	rbb Interstate	32			Box within Safe Area, Transparency 0
6	Arial		40		Text with Border
7	rbb Interstate		40		Box within Safe Area, Transparency 160
8	rbb Interstate			45	Box within Safe Area, Transparency 224
9	rbb Interstate		40		Text with Border
10	rbb Interstate		42		Band, Transparency 120
11	ARD Font	35			Box, Transparency 140
12	ARD Font		43		Box longest Line, Transparency 80
13	ARD Font			48	Text with Shadow
14	ARD Font		40		Text with Border
15	ARD Font	37			Box longest Line, Transparency 0
16	Lucida Console	27			Box, Transparency 0
17	Lucida Console		33		Box, Transparency 80
18	Lucida Console			37	Box longest Line, Transparency 80
19	Lucida Console		33		Band, Transparency 80
20	Lucida Console		33		Text with Border
21	Tiresias	41			Text with Border
22	Tiresias		45		Box longest Line, Transparency 80
23	Tiresias		45		Text with Border
24	Tiresias		45		Box longest Line, Regular Type of Font, Transparency 80
25	Tiresias		45		Text with Border, Regular Type of Font,
26	Arial		40		Text with Border
27	Tiresias		45		Box longest Line, Transparency 0
28	rbb Interstate		40		Box longest Line, Transparency 80
29	Arial		40		Box, Transparency 80
30	rbb Interstate		42		Band, Transparency 120
31	rbb Interstate		40		Text with Border
32	ARD Font	37			Box longest Line, Transparency 0
33	Tiresias		45		Box longest Line, Transparency 80
34	Tiresias		45		Text with border
35	rbb Interstate		40		Box longest Line, Transparency 80
36	rbb Interstate		40		Text with border

Users mark the individual design parameters and also the combination of these parameters. The subtitle design of each respective test week on the whole is marked using marks from 1 (very good) to 5 (dissatisfying). Users can also comment freely on the subtitles and their marks.

It was decided to systematically test five types of fonts, each for five of the total of 36 test weeks. As to the font size and the background/layout parameters these were only fixed in advance for the first weeks of the test. From then on the selection of options was adapted according to the feedback received during the first test weeks, so that, eventually all "risky" options would be banned. For example, very early in the test it became clear that the testers did not at all like a black banner. Therefore this option was left out from then on. With this step by step approach the test will come, by and by, to a reduced number of optimum choices between which the editors and other decision-makers on the broadcaster side can decide.

The range of participation (sending back a questionnaire) during the reporting period (1 April to 30 September 2009, 6th to 32nd RBB test week) was between 48 and 32 testers per week. On average 41 of the 51 testers responded. Small numbers were mainly due to holiday absence (Easter and summer holidays).

The test went very smoothly from the start. Thanks to the good cooperation with the regional disability associations RBB got advice in how to deal best with the testers. This concerned, among other things, how to communicate best in written language (i.e. the use of "simple language"). All the information material and questionnaires etc. that was sent out by RBB was checked first by the associations. RBB really tried hard to take individual care of each of the testers. This included:

- Replying in time to any request of the testers voiced in their questionnaires. These were not always related to the tests directly. This could be their wish for more subtitles in general, for subtitles for a general programme, questions on the content of subtitles, questions on why a certain programme was not listed in our programme schedule even though they knew it was subtitled originally etc. When not being able to reply to the questions on part of the project team they were forwarded to the RBB subtitle department and the responsible editorial teams. This has a positive side effect as people internally at RBB became much more aware of the issue of barrier free access.
- Reacting quickly to each question posed, or insecurity shown, as to the test proceedings.
- Dealing with personal concerns like illness or holidays with understanding and concern.
- Summing up: it is important for RBB to show the testers that it really values their contribution and voluntary engagement for such a long period of time.

A lot of time and work effort is being spent in gathering the questionnaires, reminding people of deadlines and encouraging them to submit the questionnaires. All in all, the feedback is good and RBB has been surprised how engaged and committed the testers are. However, there are quite a few testers who do not reply regularly.

As some of the testers and also an expert approached RBB with a request that RBB hold a physical meeting or workshop it was decided to invite the testers to come to RBB in order to discuss and clarify the test proceedings and also the results obtained so far. 27

of 52 testers were present and a very productive meeting was held. After introducing DTV4All and its aims, the testers' results and comments so far were presented and then discussed. A sign interpreter and a writing interpreter were also present. For the project team the discussion was very valuable as it confirmed and clarified the statistical results obtained so far. RBB's subtitle editor (teletext) and the RBB Director of Production and Operation were also present.

3.1.3 TVC (TV3) Progress

Background
In November 1989 **Televisió de Catalunya (TVC)** broadcast the first audio described film in Catalan (*The Ten Commandments*), becoming the first Western country to offer audio description. In the 90s more audio description was aired, such as some episodes of the Catalan series *Estació d'enllaç*, although not regularly. In the 21st century, thanks to cooperation with the Spanish blind association ONCE, AD was included in the Catalan sitcoms *Plats Bruts* —later released in DVD format— and *L'un per l'altre*, and the Catalan series *Majoria absoluta*.

In 2006 a new project was launched and the audio description of *La Gran Pellícula* (*The Big Film*, a selection of box-office successes broadcast on Friday night) started to be aired weekly. The first publicised film was *Something to Talk About* (16 February 2006), followed by *The Majestic* and *The Pledge*, among many others. An unannounced AD of the film *Mystic River* had been broadcast for testing purposes, so that the Catalan association for the blind and visually impaired, ACCDV, and the Spanish association ONCE could give feedback to the television network about the service.

The AD of a weekly film has been expanded in 2008 with the AD of three children's programmes which are shown over the week-end: *Hotel Zombie*, *Being Eve* and *King Arthur's Disasters*, and the Catalan mini-series *Serrallonga*, which will soon be available on DVD. Whilst in 2007 81 hours of television were audio described, in 2008 this had increased to 111 hours, and TVC's aim is to offer 160 hours of audio described television in 2009, which represents approximately 4% of the new emissions broadcast on its main channel, TV3.

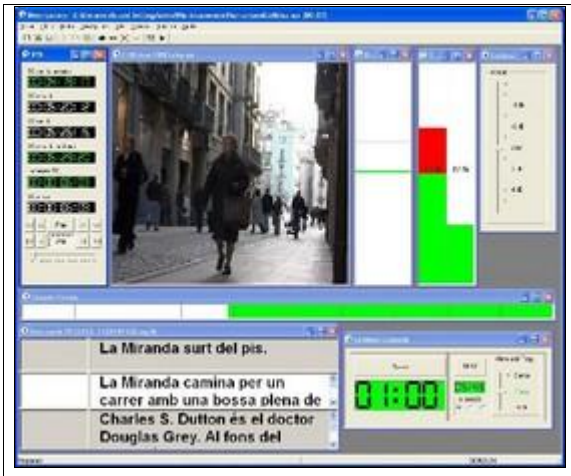
The process of AD
At **TVC** there is a special department devoted to accessibility which is made up of seven people; however, the two professionals in charge of audio describing content are free-lancers. When selecting these professionals, they are required to do a test where their knowledge of Catalan and their diction is checked, because of the high expertise required in both aspects. Moreover, in order to improve their ability, audio describers are offered further training: in 2007 they took a course on voice skills and in 2008 they participated in the international conference on Audiovisual Translation CITA.

The process of audio describing is as follows: the describer receives the product and creates the AD script. Afterwards, another professional checks its quality. Then, the same describer who created the script voices it using a computer and a microphone, not in a special dubbing booth, and again this same professional or another one watches the whole audio described film in order to evaluate if further changes are needed, both

concerning language issues and content. The overall quality of AD is checked by the Accessibility Department at TVC and feedback from blind people and associations is also received, and welcome. In terms of language, the style-sheet of Catalan television, available on the website ÉsAdir (esadir.cat), is followed, as well as some recommendations by the Accessibility Department. A standard register is generally used, although there is a certain degree of adaptation to the language style of the film.

Software

TVC uses software developed by Anglatècnic, which allows the user to create the script and voice it. There is a screen where the image is shown, an inferior box where the script is written and time codes are inserted. It also allows the AD to be revised once finished.

<table>
<tr><td> 
</td><td>Features

• Use and control of video files with Inter-frame compression (allows one to view frame by frame).
• Fast edition of time codes (the software can read the vertical time codes of a film that is being played from tape or read the image-synchronised file frames).
• Graphic display of the audio description in accordance with the programme parameters set.</td></tr>
<tr><td>• Audio level and audio attenuation indicator to ensure the same level is maintained between narrators.
• Indicator of the time remaining for the audio description in the TC window.
• Preparation of texts and TCs for audio description. This allows one person to prepare the AD (indicating TCs and the corresponding text) while another makes the recording.</td><td>• Recording and testing of the audio description.
• Provides all the commands found in an ordinary editor and ensures easy navigation between the various audio descriptions.
• When an audio description is being recorded, information on the preceding and following one is also displayed.
• Automatic simulation of the AD</td></tr>
</table>

Source: Anglatècnic's website (www.anglatecnic.cat/en-40-Audio-Description)

Fees

The cost of the service at **TVC** is 10-euros per minute, which is the fee paid to free-lancers.

Translating AD

Regarding the translation of audio description, **TVC** has not considered this possibility and envisages that, although some foreign descriptions are very well done, transcribing, translating and adapting them would also be costly. However, it should be further studied.

Technical aspects

As far as technical aspects are concerned, the first AD offered by **TVC** in 1989 used one of the stereo channels and could be heard by all the audience, which was not very welcome to most viewers. Later, AD was available through the NICAM DUAL system, which allowed viewers to activate a second audio track if they wanted it. However, with this system AD was only possible in Catalan productions because in dubbed products the second audio track was devoted to the original version. Nowadays, thanks to digital television, different audio tracks are offered, one of them including AD, both in Catalan and dubbed productions.

TVC	
1989: first broadcast of an AD film in Catalan 90s: occasional AD 2006: regular AD	2007: 81 hours of AD 2008: 111 hours of AD 2009. Aim: 160 hours (4% on TV3)

The process of AD

TVC: *Creation of AD script by script writer → Quality check by another professional→ Voicing (by the initial writer) → Final quality check*

Software and Technical aspects

	Software	**Technical aspects**
TVC	Specific software	1989: stereo channels analogue: NICAM DUAL DTV (currently): different audio track on DTV

Fees

	90 minutes (average cost)
TVC	900 euros (paid to free-lancers)

Awareness Campaign

TVC embarked on a TV campaign to make users aware of their accessibility services. This campaign had two main areas: Inform the users through TV adverts and the web. The first step was to produce a "promo advert" which will be loaded up in the ftp. This promo is shown on a weekly basis three times per week on the two days preceding the film.

Sample Promotional Advert

The web was the second approach and every day the programmes are advertised with the accessible services on offer. While the first approach has been successful, the WEB has proven difficult in two aspects:

1. Navigation through the web is not user-friendly and should be improved.
2. AD is tagged with a visual marker, and it should be an oral marker to suit the targeted audience.

TV3 tests for DTV4All Progress to Date

TVC embarked in a series of tests to gather information regarding user satisfaction, quality control, and ways to improve its services. To this end two questionnaires were prepared, and they aim at gathering different information.

First a general questionnaire was drafted, using similar questionnaires as those used by subtitling in DTV4All and the RNIB report on Bollywood (2009)[1]. The general questionnaire aims at learning about users' preferences, and also helps to draft a profile of the user, education, expectations, etc. The questionnaire was designed to take no longer than 15 minutes to complete. It is to be completed anonymously. Full text of questionnaire attached in Section 7.

This general questionnaire aims at collecting quantitative data. The questionnaire was digitised by Activa Multimedia and sent to the two local Blind Associations ONCE (Organización Nacional de Ciegos de España) and ACC (Associació Catalana de Cecs). It was also sent to the users we have been keeping informed as they have been giving feedback on the AD service from the first day of films with AD.

The Catalan Association for the Blind will distribute the questionnaires among their membership and will help those without electronic mail and those who may have difficulty answering the questionnaire.

[1] http://www.rnib.org.uk/livingwithsightloss/tvradiofilm/film/Pages/bollywood.aspx

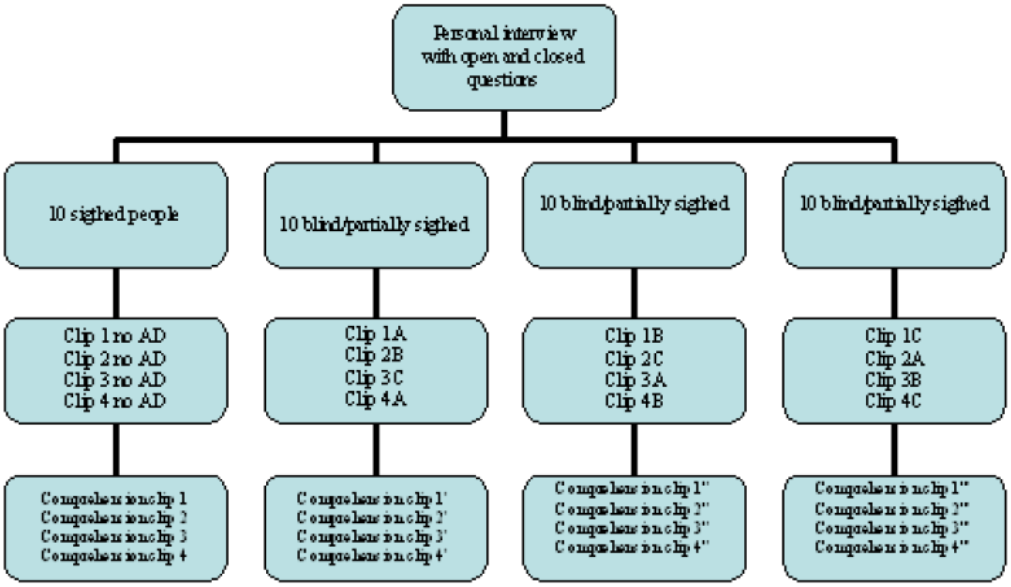
Regarding ONCE, as of yet TV3 has not been able to speak to someone with responsibility for this area however we have a visually impaired contact who works there and who will help us distribute the questionnaires to their many contacts. The data will be gathered by TVC and further analysed.

Regarding qualitative tests, an experiment was set with viewers. The aim was to analyse how viewers, without AD, perceive an audiovisual input (both visual and sound channels). For this purpose a Quasi-experiment has designed with a view to manipulating various AD parameters/variables and to analyse their impact on comprehension. The variables are as follows:

- Explicitation
- Speed
- Intonation
- Silence

The Corpus of the experiment involves Commercial films, Dubbed and AD in Catalan and Broadcasted by TVC every Friday night. The AD was recorded by audio describers themselves. In terms of the clips, 4 self contained clips of 5-6minutes were selected with which to experiment with the AD variables.

The reception study format was designed as follows:



The experimental group is made up of the following characteristics:

–Blind and partially sighted
–Different ages and backgrounds
–AD and non-AD users
–Understand Catalan: 30 users divided in 3 similar groups of 10

The Control group comprising of 10 users is made up of

–Sighted users
–Different ages and backgrounds
–Understand Catalan

The comprehension will be tested via a personal interviews and questions based on each clip's

–Actions
–Characters (appearance, personality)
–Interaction among characters
–Place
–Time
–Cause-effect relations

The use of tagging software/ discourse analysis as well as a Judges' rating scale will support the analysis of the results.

3.2 Universities and the mature access services evaluation: Progress to Date

UAB and Roehampton have taken the lead role in the testing process. Extrapolating the format of tests carried out to date in the other universities will result in the region of 40,000 subtitles read by hearing, hard of hearing and deaf participants, which constitutes the largest corpus of its kind (eye-tracking plus comprehension plus opinion) and a treasure trove of information for research, further projects, etc. We can then attempt to map out, for the first time with this size of eye-tracking and questionnaire-base data, how hearing, deaf and hard of hearing viewers read and comprehend subtitles.

Apart from the contents of DTV4All, the present analysis of Subtitling has yielded interesting data with regard to other issues that could constitute the basis for further research:

1- Mean Reading Time

2- Min. / Max. Exposure Times

3- Information Priority (Image Vs Subtitle)

4- Overall reading patterns per type of deafness, education, age and viewing habits

The other universities contributing to the work of the project have drafted and translated questionnaires for Subtitling of the Deaf and Hard of Hearing (SDH). They have also started establishing contacts with users associations, and deciding on the material which will be used for the eye-tracking tests. Subtitling this material in the different formats and languages is also well under way.

Some tests have been done in order to ascertain the validity of test material and allow for adjustments to be done before embarking in a pan European experiment.

For AD the first deliverable is finished and results were outlined in D2.3. The objective was to present the audio describing practices of three different companies which would shed some light on issues such as:

1. **AD services**: AD services provided so far and the companies' future prospects for AD
2. **The process of AD**: how AD is carried out.
3. **Software**: presents the specific software used for AD
4. **Fees**: if disclosed, the fees for ADs are reported.
5. **The translation of audio descriptions**: a new alternative for AD generation
6. **Technical aspects**

3.2.1.1 Subtitling team Progress to date by UAB

The following numbers outline the range and volume of tests that have been completed.

- 17 participants (5 deaf, 5 Hard of Hearing, 7 hearing)
- 500 subtitles per participant
- 2800 subtitles read by deaf
- 2800 subtitles read by Hard of Hearing
- 3900 subtitles read by hearing
- Total = 9500 subtitles
- 69 comprehension questions + 24 questions to contrast each user (465 replies from deaf, 465 Hard of Hearing and 651 hearing)

In terms of analysing the data the first task that has been completed is the preparation of the model of analysis. This will be used by every partner to analyse the information obtained in the tests and then compare it. This model of analysis is in turn divided in three parts, looking at opinion (based on questionnaires, before and after the tests), comprehension (based on questionnaires during the tests) and reception (eye-tracking data on how subtitles are read and processed).

- The pre and post test questionnaire data gathering is complete
- The comprehension data gathering is complete
- The eye tracking data analysis is ongoing.

This report outlines in section 4 some of the Interim findings and conclusions of the UAB testing team.

3.2.1.2 Progress to date by the University of Roehampton

Using the same data analysis model the following figures represent the significant progress that has been achieved in Roehampton.

-23 Participants

Tested 400 subtitles per participant
- 2000 subtitles read by deaf
- 3200 subtitles read by Hard of Hearing
- 2800 subtitles read by hearing

Total = 8000 subtitles, more than 80 comprehension questions for each user (400 deaf, 640 Hard of Hearing and 560 hearing), that is 1600 questions.

While UAB and Roehampton have been taking the lead it should be noted that progress is ongoing in the other universities with the exception of the Hellenic Open University who have not been active due to resourcing reasons. The Belgian team has completed the Audio Description tests and have provided their results. They have also delivered Pear Tree results. They drafted and translated the Subtitling questionnaire and have been in contact with the relevant local associations. Unfortunately due to a lack of response from users there was nothing more that they could do. The Italian partners have submitted Pear Tree results as well as Audio description Deliverable 2. They are currently working on Audio description Deliverable 3. Poland and Denmark are actively working on the Subtitling deliverables and will be following the test format suggested by UAB and Roehampton based on the lessons learned.

4 Interim Findings

4.1 Broadcasters and the mature access services evaluated

4.1.1 DR

Audio Description and Audio Subtitling

- Work done within the project DTV4All indicates that the DR approach to AD, while being of high quality from a user perspective will run into both production and transmission issues in the next 2-3 years due to the relatively high production costs and the need to transmit an additional set of stereo tracks at 256 kbit/sec. Awareness of other solutions from Red Bee and TVC opens up a discussion on different work flows and a migration from broadcaster to receiver mix.
- The user consultations from December 2008 onwards indicate that further clarification of the roles of Audio Description and spoken subtitles would be beneficial, as this would allow an increase in the services for those with visual impairments without any major increase in budget.
- In the medium to long term, the use of speech synthesis chips such as that used in the RNIB pilot project could accelerate the production and take-up of spoken subtitles if the subjective quality of such services meets user expectations.

Subtitling

- There is a general trend in the direction of almost 100% provision of subtitles for the deaf and hard of hearing in Europe.
- Work done in the first quarter of 2009 has highlighted gaps in European knowledge about live subtitling services and how these are perceived by users with varying degrees of hearing impediment.
- The project has also identified gaps in the availability and quality of re-speaking systems that can produce live subtitles, in particular in countries with languages that are less widely spoken.
- Main conclusions.

The interviews with the 29 subjects in the live subtitling exploratory study confirmed that the delay in displaying the subtitles was a significant challenge to all the subjects who tried to use news items with live subtitles. The final results will discuss the various viewing strategies followed (including turning down the audio and focusing exclusively on the subtitles, or concentrating on the audio and using the subtitles as a last resort option where understanding was deficient.

4.1.2 RBB

Aspects of Technical Feasibility

1. Technology pre-tests

As mentioned above, technical feasibility of the DVB subtitle production is the second point of interest in RBB's subtitle field test. In Deliverable D2.3 the results of the technology pre-tests involving three transcoder systems and their interaction with 13 set-top-boxes were documented. These results, especially detailing the faulty depiction of DVB-subtitles on a large number of set-top-boxes, will first be provided to DR who will compare them with their own results. Finally, a list will be given to IRT in order to approach the Set-Top-Box manufacturers for improvements of the Set-Top-Boxes compatibility with the `DVB-subtitle standard.

2. Problems with subtitle transcoding in the course of the test

A. Three line subtitle problem

In Deliverable D2.3 the faulty presentation and its origins of triple-space subtitles in the DVB mode was described in detail. In the meantime, the transcoder manufacturer provided a new software version that improved the presentation. However, the problem was not solved in a satisfying way and the testers kept complaining about this issue in their questionnaire feedback as this concerned the main nationwide news programme at 8pm. The third subtitle line is delayed, also in the teletext depiction. In the DVB-subtitle mode this delay is increased through "rendering" of bitmaps and renewed broadcast. It is now assumed that signal distribution components ahead of teletext insertion are the problem. This is currently being investigated.

B. "Jumping subtitles"

The irregular and very irritating positioning of RBB's regular two line subtitles also described in detail in Deliverable D2.3 has now been solved with a second software update by the transcoder manufacturers. However, there will have to be a final check before entering regular operation of DVB-subtitle broadcast.

End user Feedback

As described above, with its field test covering 36 weeks of weekly subtitle evaluation by a user group of 50 hearing impaired and deaf people RBB wants to find out the optimal DVB-subtitle design from the end user point of view.

In the course of the tests so far, it has already become quite clear that the result will always be a compromise as on the one hand some design options or parameters are clearly "don'ts" according to statistics and users' comments. Other different options, however, are equally popular and thus controversial. Thus, at the end of this reporting period it has become quite clear already that the favourites are a medium size in terms of the size of font. Three types of fonts of the five are judged much more favourably than the others. As to the background design the two favourites are a slightly transparent box and a border or rim.

For evaluation of the tests the statistical data of each week are collected and documented on a regular basis. Once a week, just before the new test week starts the project team comes together, looks at the data and decides about the parameter constellation of the test week to come. As described above this flexible approach is used in order to be able to exclude early on options that do not seem attractive at all for testers and to directly oppose favourites of one variable from one week to the next. Furthermore all the free comments from each week's questionnaire are collected and documented in an extra document. All the more general comments on subtitles are forwarded to the RBB subtitle department.

The evaluation approach will be to use these comments in order to complement and interpret the statistical data better.

The following screen shots show the users' favourite options derived in the course of the reporting period. Explanation: The subtitle design of each week is rated by the users.

This concerns 1) marking each single parameter like font or font size separately and 2) judging the overall impression of the combination of parameters of the respective week. The screenshots below depict 1) the two best ratings of the combination of the *single parameters* of each week during the reporting period and 2) the two best ratings of the overall design of the DVB-subtitles of each week. Evaluation was done by considering best marks 1 to 3 minus the numbers for marks 4 and 5 ("bad" and "very bad"). The latter was done in order to eliminate the most controversial solutions.

Combination most popular single parameters – average size Tiresias with border/rim (best rating)

Combination most popular single variants – average size Arial with an 80 % translucent box adapted to longest line (second best rating)

Most popular overall (combined) design – Arial, average size with a border (best rating)

Most popular overall (combined) design – Arial, average size with a 120 % translucent box adapted to longest line (second best rating)

4.2 Universities and the mature access services evaluated

4.2.1 UAB Results - Background

The results are divided in three parts, looking at opinion (based on questionnaires, before and after the tests), comprehension (based on questionnaires during the tests) and reception (eye-tracking data on how subtitles are read and processed).

4.2.1.1 Test Group

17 participants in 3 different groups:

- Hearers (7)
- Deaf (5)
- Hard of Hearing (5)

NOTE: by “Deaf” we refer to “Signing Deaf”. “Hard of Hearing” refers to “Oralist Deaf”. This classification is essential in terms of reading skills.

4.2.1.2 Parameters

The test consists of 23 one-minute videos testing 9 parameters and 2 or 3 variables per parameter:

- 1) Identification
  - Tags
  - Colours
  - Displacement
- 2) Placement
  - Top
  - Bottom
  - Mixed
- 3) Justification
  - Left
  - Centred
- 4) Boxes
  - Boxes
  - No boxes
- 5) Borders
  - Borders
  - No borders
- 6) Shadows
  - Shadows
  - No Shadows
- 7) Emoticons
  - Description
  - Emoticons
  - Nothing
- 8) Icons
  - Description
  - Icons
  - Nothing
- 9) Speed
  - Standard
  - Verbatim
  - Edited

All participants have been exposed to the same stimuli: identical videos with sound for the three groups.

4.2.1.3 Technology

The test is carried out using eye-tracking technologies (Tobii T-60 + Tobii Studio 1.5.8). The Tobii Tracker is integrated in a 17" TFT monitor. Although the TFT monitor displays 1280x1024, videos are sized 900 x 600, given the tracking distance recommended (50-80 cm.). The system has a 60Hz bitrate and a 0.5 degree accuracy. Further customised software modifications were required to reduce the 0.5 degree error (represented in displaced fixations during the "Replay Mode")

4.2.2 PreTest/Post Test Questionnaire Background

The data obtained from the questionnaires were filled in by all participants before and after taking part in the test. The detailed form, that included 63 questions, provides information on the education, viewing habits, and preferences of the volunteers enrolled. It is based on a similar questionnaire disseminated in Great Britain in the '90s within the project "Switched On".

The questionnaire, adapted to the Spanish language and context, was customised with the help of deaf teachers and trainers, in order to avoid ambiguity, and to make sure that deaf users would be able to fill it in individually without any help. Although the project bases its research on the reading capacities of this community, it must be taken into account that, for some Deaf participants, Sign Language Interpreters were needed to help volunteers with some of the questions.

Although many associations and communities all over Spain were contacted in order to enlist the help Deaf and Hard of Hearing participants for our research, it was very difficult to recruit people to be involved in the project. The volunteer nature of the test (no payment for it); the time spent (1 hour per participant: many people took part in the test but didn't finish it, making their recordings useless in terms of data validity); the task required (comprehension tests) and the difficulties experienced in our first sessions (abnormal functioning of the tracker), all served to reduce the number of willing participants.

However, we would like to thank MQD-Aransbur, Arabako Gorrak, Fiapas and the "Centro Cultural de Personas Sordas de Palencia" for their kind collaboration and help, having provided not only the infrastructure, but also professional support. In addition the many individual participants who enrolled in the project contributed to its successful execution.

Participants in the eye-tracking sessions in all three groups: Deaf, Hard of Hearing, Hearers, are men and women from 29 to 46 years old. Most hearers (70%) have higher studies (university or similar), whereas only 40% of Hard of Hearing and just 20% of Deaf volunteers have university diplomas. 80% of deaf participants have only Primary / Secondary studies and attended specialised schools. It is especially remarkable this group, when asked about their mother tongue, 80% of the deaf participants enrolled declare themselves to be "bilingual", although the responses provided within the questionnaire reveal the use of ESL syntax in written Spanish. This fact already shows the difficulties of this community in terms of heterogeneity and self-perception.

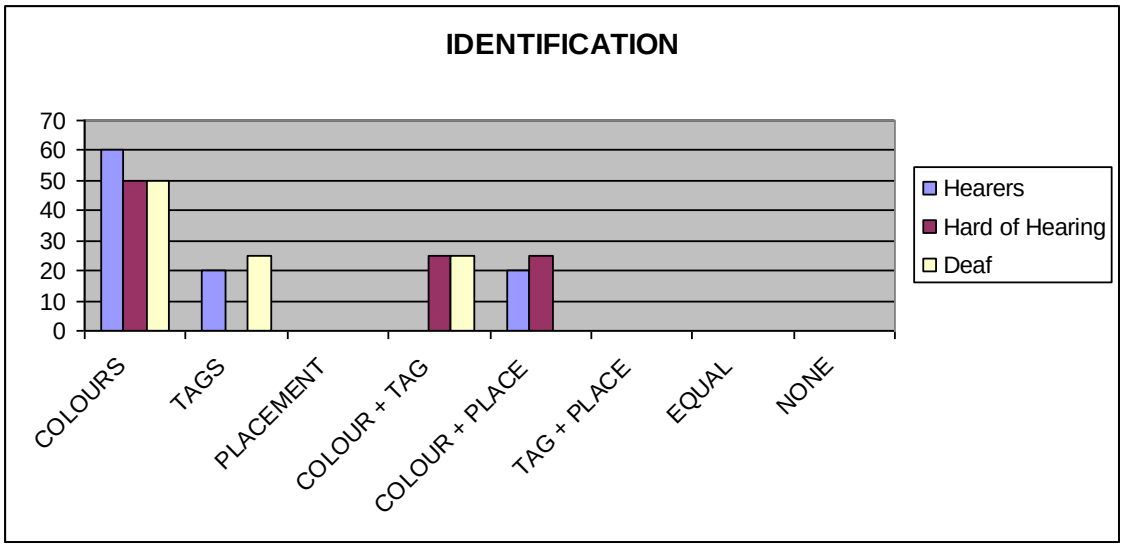
In this report you will find the preferences of all three groups reported with respect to the most representative parameters. Only Identification, Placement, Boxes, Emoticons, Icons and Speed could be represented in the questionnaire, as very specific elements such as Justification, Shadows and, Borders could have never been explained and / or represented, and users would have never been aware of the differences, if any.

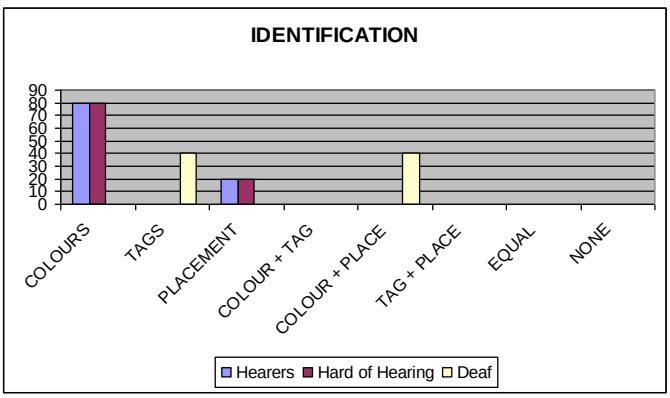
On the other hand, it is important to report that 80% of Hard of Hearing and Deaf participants know that there is a National Standard for SDH, although just 1 of the participants knew the content of the UNE-153010. On the other hand, only 20% of all the Hearing volunteers knew about the UNE-153010, but did not know its name and / or content.

4.2.3 Pre/Post test Questionnaire Results

The Pre-Test Questionnaire and the Post Test Questionnaires analysed the respondents' responses under the parameters previously mentioned

4.2.3.1 Parameter 1 IDENTIFICATION





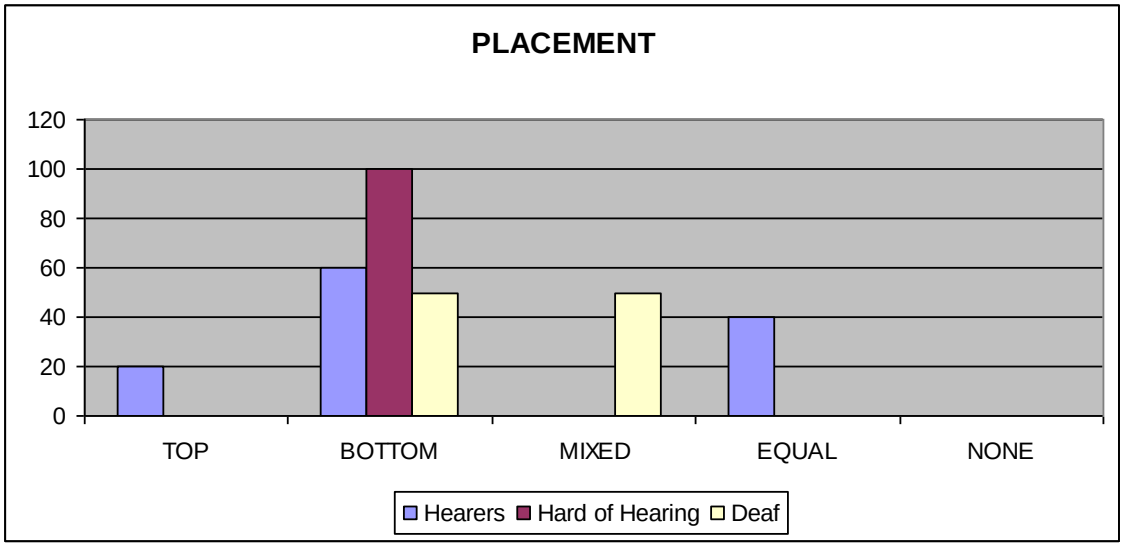
Pre-test questionnaire

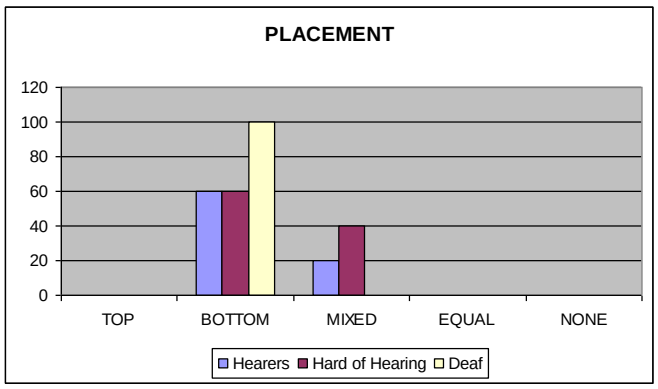
Colour is the option supported by all groups (50% Hard of Hearing and Deaf, 60% by Hearers); whereas 50% of Deaf and 25 % of Hard of Hearing participants would also prefer colour in combination with displacement or tags. Surprisingly, this option was not considered favourably in pre-test questionnaires for the Deaf. This difference in responses could be explained by habit as this is the norm in Spain.

Tags, as revealed in pre-test questionnaires, seem to be the best alternative, together with colours, for character identification in deaf users, either alone or in combination with colours and / or displacement. The option, that adds extra text to the subtitle, makes reading longer. Although not a single user chose displacement as the only technique to apply for character identification in this case, 20% of hearing and 25% of Hard of Hearing users prefer its use in combination with colour. This coincides again with a bigger exposure to video-games and different subtitling practices.

75% of Deaf and Hard of Hearing users would prefer their main options, colours alone or in combination, to be applied to all audiovisual products. For Hearers, it is less relevant to keep this harmonised display, and only 50% would defend a homogenous use.

4.2.3.2 PLACEMENT





Pre-test questionnaire

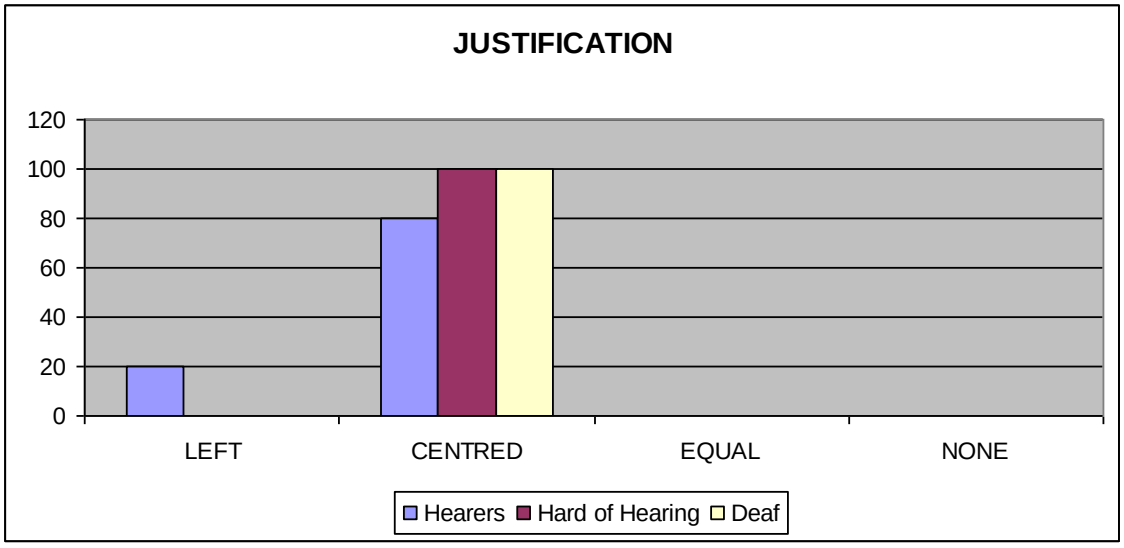
Results seem to be inverted in this case. Bottom placement remains the most popular option in all three groups. It is representative of the fact that the Hard of Hearing are 100% for this option although only 25% of them would want subtitles to adopt a bottom displacement in all audiovisual products.

Surprisingly, deaf users, that were previously 100% for bottom placement, are now 50% for mixed positioning, with sound information displayed at the top right corner. This could be conditioned by tradition and habit, as mixed placement is the standard adopted for TV SDH.

Hearers, however, show no major preference for any option apart from the bottom placement (60%), which is generally used in standard subtitling. The help of the soundtrack explains this fact: most hearers do not read sound information displayed in mixed positioning (See eye-tracking information)

75% of the Deaf and 60% of the Hearers taking part in the test would prefer subtitles to be displayed identically in all audiovisual products. However, only 25 % of the Hard of Hearing have a preference for this standardised use and 50% are against it.

4.2.3.3 JUSTIFICATION



Spanish subtitling has traditionally preferred a centred justification in most audiovisual products and indeed other forms of subtitling. This extensive practice seems to have become habit and this is represented in the high rate of support to this option: 100% for Hard of Hearing and deaf users.

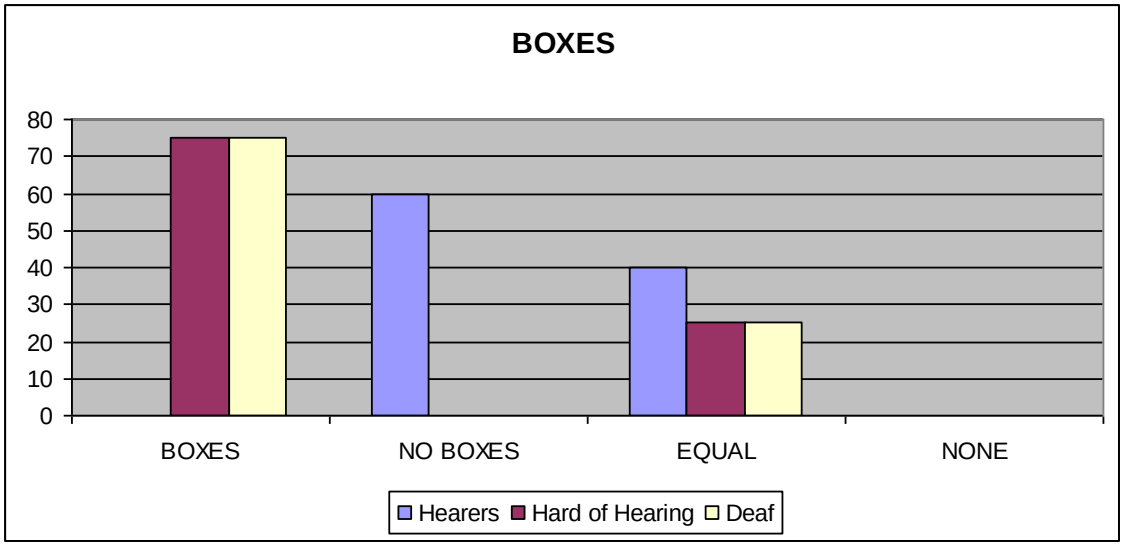
Only 20% of hearing users are for left justification. This could be explained by their viewing habits: users are used to watching foreign audiovisual products subtitled.

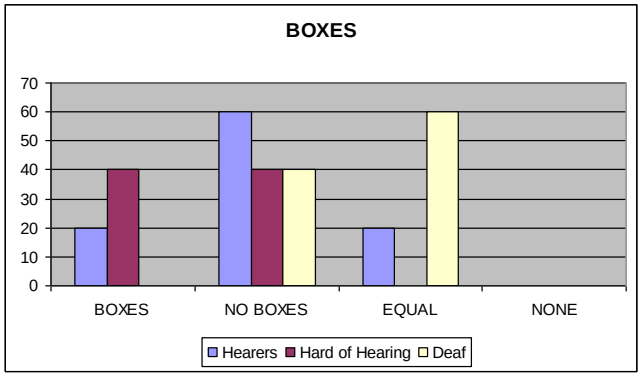
Over 75% of all users would prefer subtitles to be centred in all audiovisual products. Nowadays, current subtitling practices are also limited by technical restrictions, altering this situation depends on the product: live subtitling, respoken, typed, or stenotyped, comes left justified. However, all other subtitles broadcast or recorded are centred,

making it possible to alternate both styles in the same program. This would explain the higher rate of preference for centred subtitles.

No data on pre-test preferences can be provided, as the technical nature of the question did not recommend its incorporation in the long pre-test questionnaire. The same issue applies to the parameters "Borders" and "Shadows".

4.2.3.4 BOXES





Pre-test questionnaire

Although 75 % of the Deaf and the Hard of Hearing show a clear preference for boxes, the remaining 25 % show no significant preference for / against it. Furthermore, they do not indicate a strong preference for the consistent use of a box in most cases: only 50% of the Deaf do, and just 40% of the Hard of Hearing.

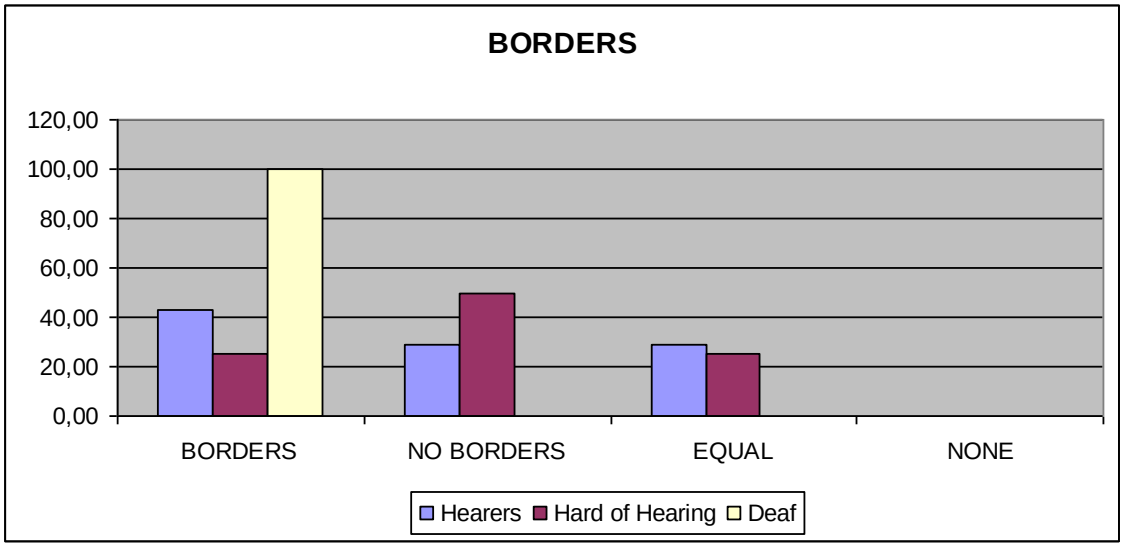
This situation is significantly different when compared to the results in the pre-test questionnaire. There, 40% of the Hard of Hearing went for the use of boxes, whereas there was no clear preference for it among the deaf. Moreover, Hearers were

considerably in favour of the "no boxes' option and 60% of the hearing would prefer a consistent use.

As we have seen, although users do not really prefer the use of boxes, when it comes to practise, their preference comes more realistic, rising from a 40% preference for the Hard of Hearing to a 75%; preference. For the deaf, pre-test 60% of responses indicated no preference but post-test 75% of the deaf preferred boxes. Once again, as happened with mixed positioning, the high exposure of Deaf and Hard of Hearing users to analogue teletext conditions habits and preferences.

Hearing users, less exposed to this kind of subtitles, do not show a preference for this element.

4.2.3.5 BORDERS



This minor element reveals one of the most consistent and distinctive replies within the Deaf when compared to the Hard of Hearing: 100% of the deaf participants are for the use of borders in letters, against 25 % among the Hard of Hearing and 45% among the Hearers.

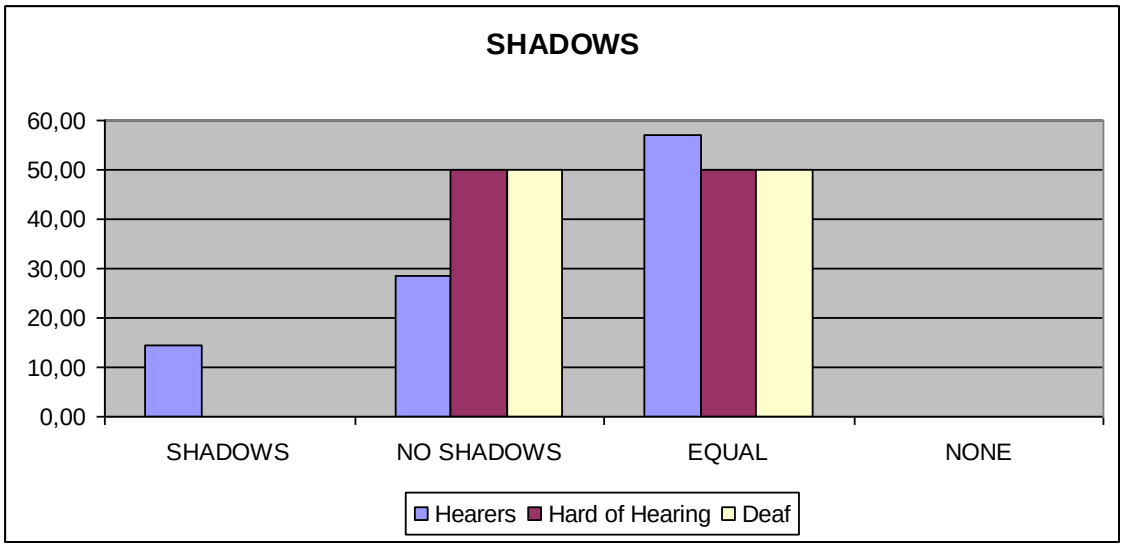
The Hard of Hearing are mainly for the use of "no borders" in letters, with another 25% showing no specific preference for the use / not use of borders.

Only 50% of the Hearers require a consistent use of borders in all audiovisual products. The remaining 50% did not experience any difference in perception. Something similar happened with the Hard of Hearing. In this group, only 25% of the volunteers would not accept an identical pattern in all products. 75% of the Deaf, however, went for the use of borders in all audiovisual products. No data on pre-test preferences can be provided, as the technical nature of the question did not recommend its incorporation in the long pre-test questionnaire. In most cases users could not even tell the differences between the variables apart and could not specify how this element was represented in ordinary subtitling (not needed in ordinary analogue teletext due to the use of boxes but present in recorded DVD SDH).

Only the results of eye-tracking tests will provide further information on the differences in perception / reception.

The same issue applies to the parameters “Justification” and “Shadows”.

4.2.3.6 SHADOWS



Both the Deaf and the Hard of Hearing show preference for the use of no shadows in 50% of their answers, together with another 50% that shows indifference to the use / not use of it. This comes to 55% in Hearers. Only 15% of Hearers are for the use of shadows, although not a single user in any group could tell the difference between both types apart.

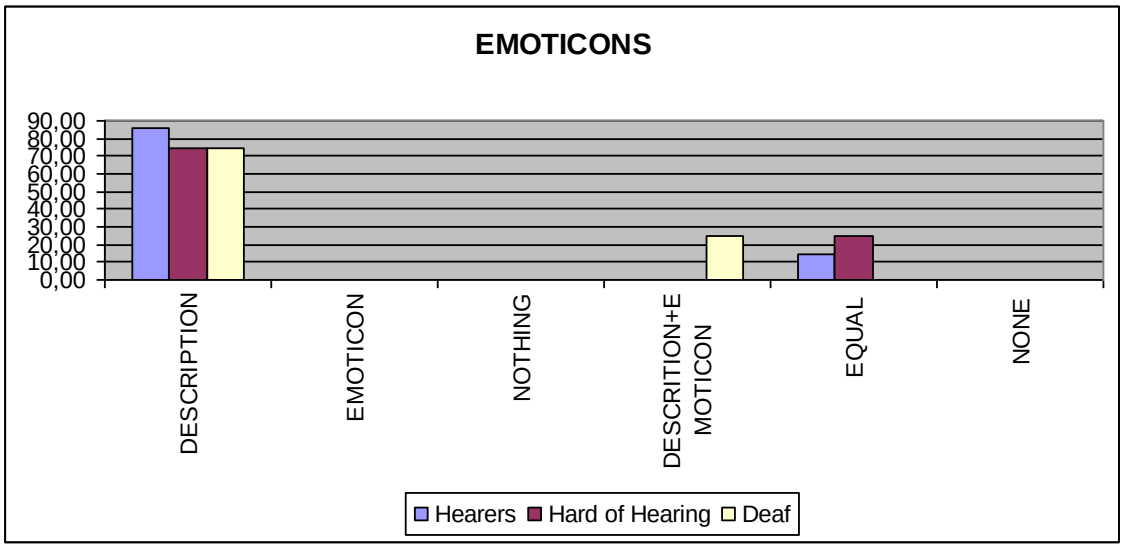
No data on pre-test preferences can be provided, as the technical nature of the question did not recommend its incorporation in the long pre-test questionnaire. In most cases, as with borders and justification, users could not even tell the difference between the variables apart and could not specify how this element was represented in ordinary subtitling (not needed in ordinary analogue teletext due to the use of boxes but present in recorded DVD SDH).

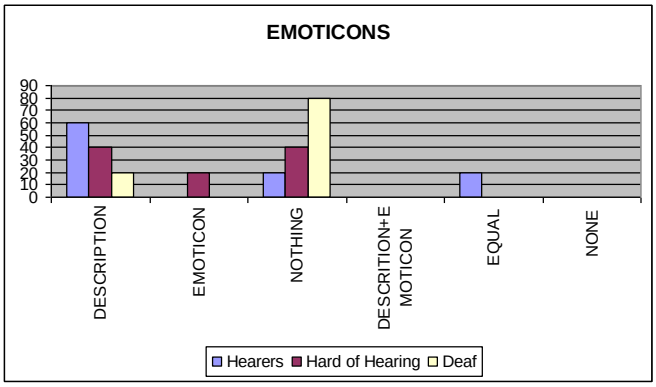
As a result of the technical nature of this parameter, when asked about the imposition of its use in all audiovisual products, all groups show a 50-75% of abstention, as it was impossible to tell the variables apart.

Only the results of eye-tracking tests will provide further information on the differences in perception / reception.

The same issue applies to the parameters “Justification” and “Borders”.

4.2.3.7 EMOTICONS





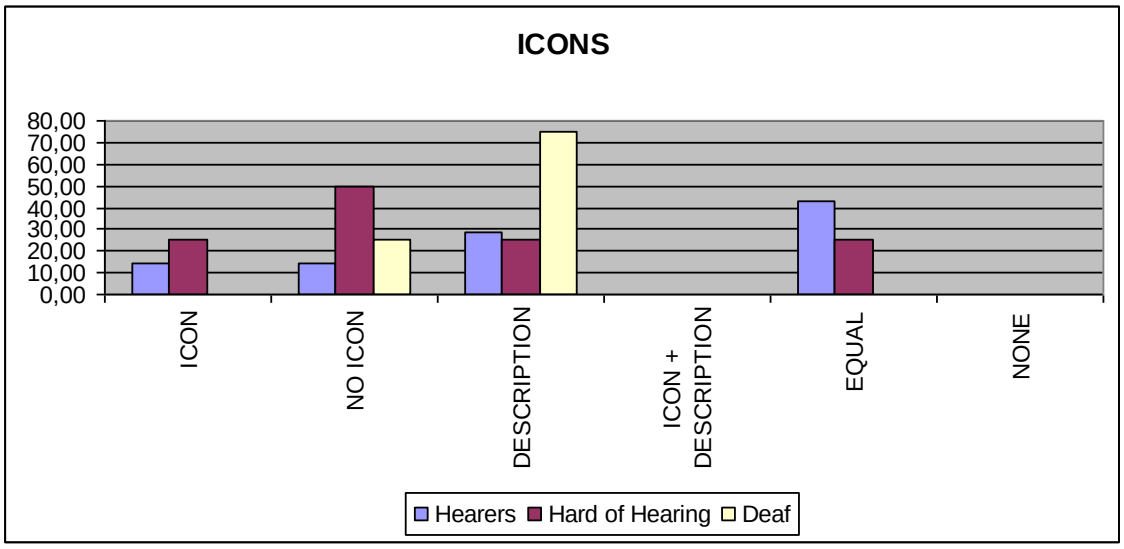
Pre-test questionnaire

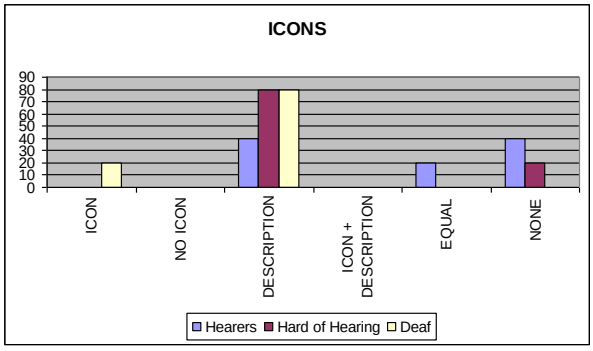
Description is the main option for all three groups (85% Hearing, 75% Hard of Hearing, 75% Deaf). This was the preference of Hearers in pre-test questionnaires but not for the other two groups who preferred no description or even emoticons. After the test, not a single user considers the option "nothing" as a possibility, even "emoticons" are no longer considered on their own but in combination with description.

These changes are especially illustrative, because they show, once again, how preferences are affected by habit: although emoticons are accepted and included in the UNE-153010, they are not used, and users are not familiar with them because of their use in TV. Many users cannot identify the meaning of the emoticons. 'Description', the technique used in Spanish SDH to convey this meaning, although considered secondary in pre-test questionnaires, was shown to be the preferred option as selected by the majority of users in all groups post test. Moreover, both Deaf and Hard of Hearing participants would prefer this technique to be used in 75% of situations.

Deaf users cannot always infer the emotional meaning of a given subtitle without a description, no matter how much information can be obtained from scene. However, results derived from comprehension questionnaires could shed some further light on specific aspect, together with the results of the tracking processes.

4.2.3.8 ICONS





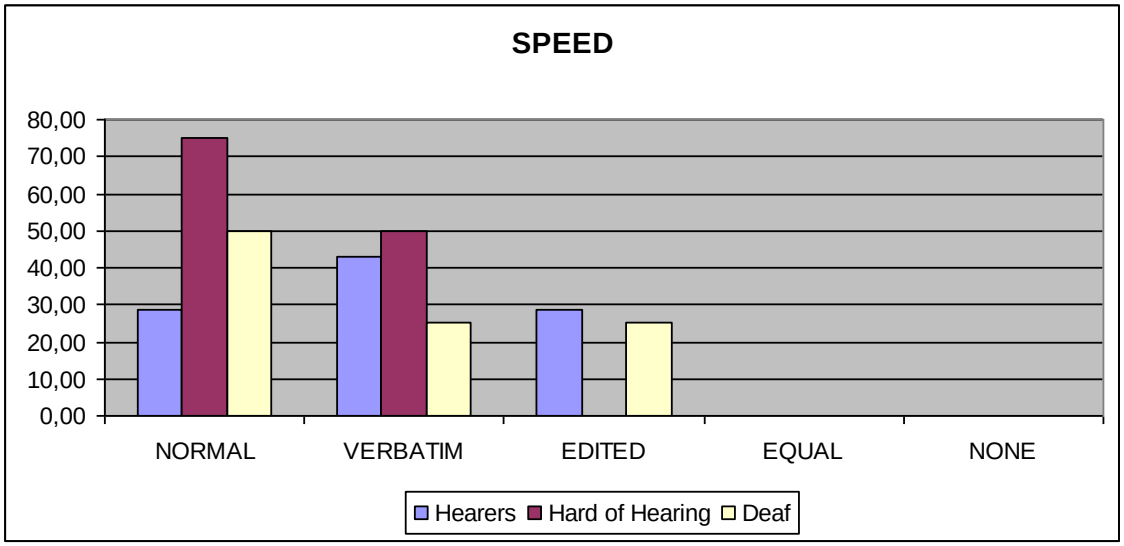
Pre-test questionnaire

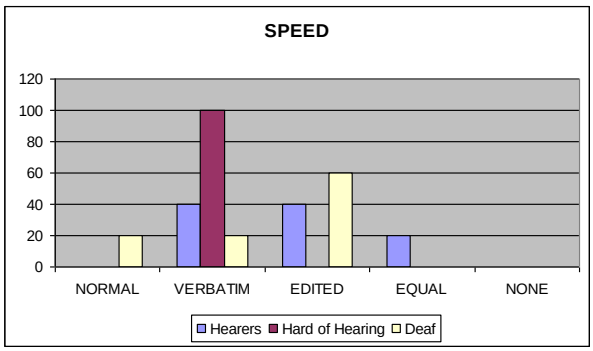
As for the use of Emoticons, with regards to the representation of sound the Deaf choose 'description' (75%) post-test. This is almost the same result obtained in pre-test questionnaires. Only 25% of this group needs no description or icon representation. This could be explained, once again, by habit and the real acceptance of the impossibility of gaining certain information from visual scenes.

The HoH choose description, from 80% in pre-test questionnaires to 25% percent in post-test questionnaires, while another 50% rejects the use of any icon and / or description to convey sound information. Unlike the Deaf, the HoH can sometimes use their hearing to gain information, just as Hearers do (30%), and that would explain their rejection for this "help", which is many cases is considered patronising and / or simplifying.

Hearers show a generalised indifference to this element (45%): not aware of the needs of deaf users, and not knowing the characteristics of SDH, the representation of this information seems redundant, as users also had access to the soundtrack during the test. It is representative how many users could remember the sound information reproduced but were not able to remember the words that represented the given sound: this fact gives as a clue on how aural perception and visual perception are not equally important in terms of memory.

4.2.3.9 SPEED





Pre-test questionnaire

Subtitling speed is the key controversy in most debates on subtitling. As shown in pre-test questionnaire results, Hard of Hearing users go for verbatim subtitling 100% when asked about this issue. However, when it comes to practice, their preferences decrease to 50% percent and they prefer ordinary (standard) subtitling in most cases (75%)

On the other hand, Deaf users, generally opted for edited subtitles (60%) pre-test, but tend to reject edited subtitles (only 25% for it) post-test and go for standard subtitles too (50%).

Only Hearers, relying on their aural memory, go for verbatim first (45%), although the number of volunteers who support the use of edited subtitles is also remarkable (25%, versus 60% in pre-test questionnaires). The explanation for this abnormal response could be derived from habit as well: Spanish hearing viewers are not used to "reading" audiovisual products, and such a "distracting practice" doesn't let them enjoy the audiovisual product. The idea of getting a "summary" through subtitles provides extra-time in their reading patterns to enjoy the scene, and this is the explanation to their pre-response.

Their previously held preferences, represented in pre-test questionnaires, is somehow 'corrected' after the test: the speed of the video allows a high but comfortable word-rate, closer to standard subtitling than to edited format. However, this hypothesis must also be confronted with all the data derived from the tracking session.

4.2.4 UAB Results of Comprehension Tests

The Comprehension results reflect the results of the questionnaires that were administered during the tests.

4.2.4.1 Scoring Methodology

Together with the eye-tracking tests, viewers were exposed to comprehension tests: 3 questions per video:

- One question on text content
- One question on visual content
- One question on global meaning

There are overall 23 questions on text, 23 questions on image and 23 questions on global meaning. The final questions were the result of brainstorming sessions and the approval of psychologists from Transmedia Catalonia, specialised in research in comprehension.

Results were analysed / scored as follows:

- correct answers: 2 points
- partially correct / incomplete answers: 1 points
- incorrect answers: 0 points

4.2.4.2 Approach to Questionnaires

Participants would have seen every video and answered every questionnaire immediately after it. In order to minimize the effect of fatigue in the tests, a randomized participants order has been established in the parameters to test.

	TOTAL HEARERS		
Parameter#	**Text**	**Global Meaning**	**Image/Visual Content**
1	1,33333333	1,06666667	1,46666667
2	1,53333333	1,86666667	1,46666667
3	1,6	2	1,4
4	1,6	1,3	1,6
5	1,66666667	1,83333333	1,16666667
6	1,71428571	1,71428571	2
7	1,33333333	1,71428571	1,80952381
8	1,61904762	1,61904762	1,33333333
9	1,42857143	1,9047619	1,38095238
	1,53650794	1,66878307	1,51375661	**1,57301587**

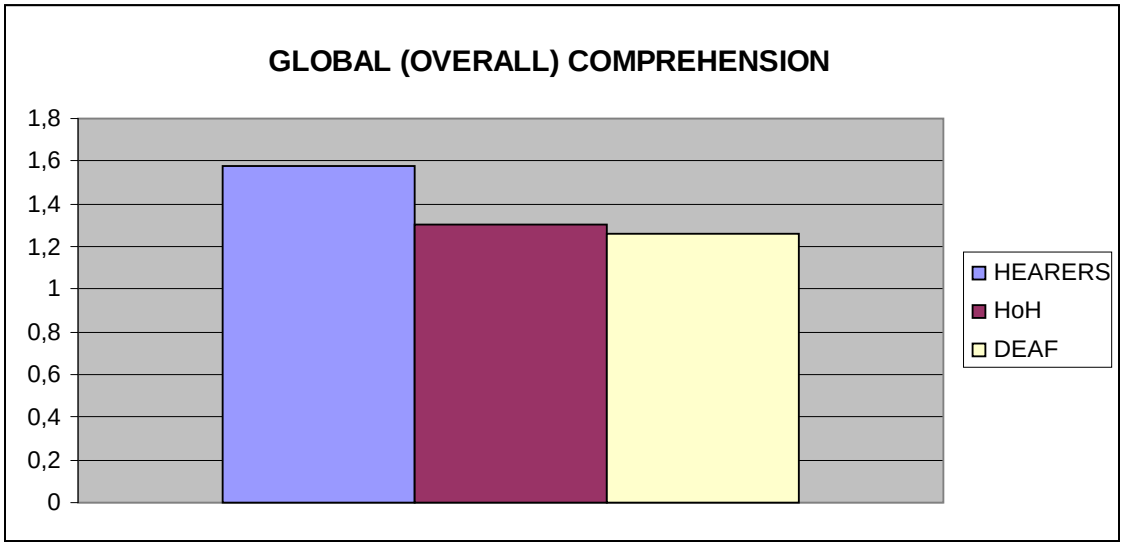
	TOTAL HARD OF HEARING		
Parameter#	**Text**	**Global Meaning**	**Image/Visual Content**
1	0,58333333	0,66666667	1,41666667
2	1,75	2	1,5
3	1,25	0,875	1
4	1,25	1,125	1,25
5	1,75	2	1,5
6	1,5	0,75	1,75
7	1	1,5	1,83333333
8	0,58333333	1,33333333	1,16666667
9	1	1,75	1,16666667
	1,18518519	1,33333333	1,39814815	**1,30555556**

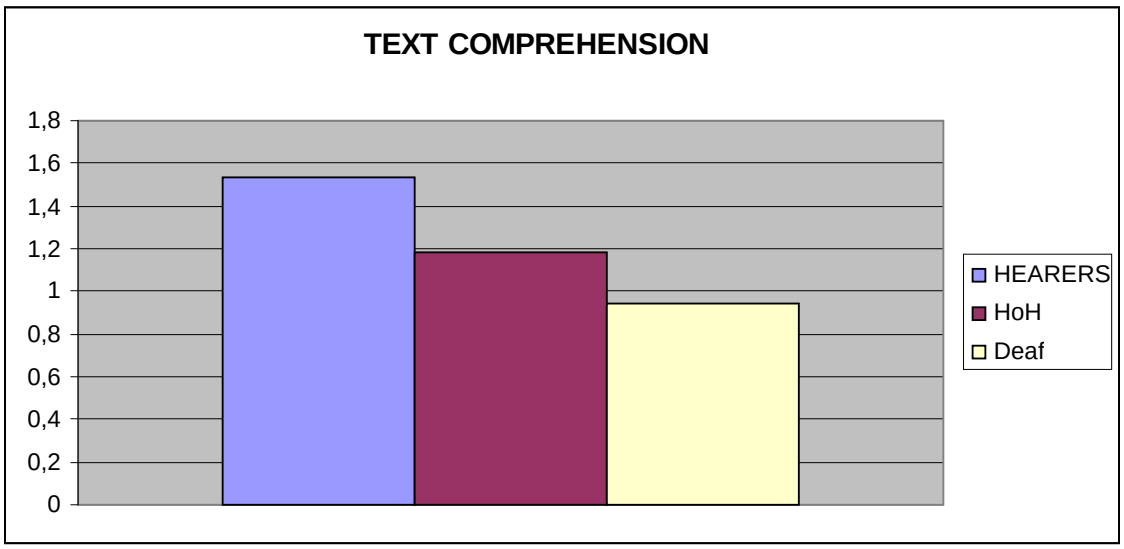
	TOTAL DEAF		
Parameter#	**Text**	**Global Meaning**	**Image/Visual Content**
1	0	1	1,58333333
2	1,16666667	1,16666667	1,33333333
3	1,25	1,25	0,75
4	1,25	1,75	1,25
5	0,75	1,75	2
6	1,25	1	2
7	1	1,33333333	1,83333333
8	0,66666667	1,25	1,25
9	1,16666667	1,66666667	1,33333333
	0,94444444	1,35185185	1,48148148	1,25925926

This data implies that Hearers achieve a 1.57 comprehension, considering 2 the result for total comprehension; 1 for incomplete / approximate information; 0 for no comprehension. This result is considerably higher than the 1.30 obtained by Hard of Hearing users, and 1.26 obtained by the Deaf. The average results for Hard of Hearing and deaf users seem to be slightly different in terms of global comprehension. Only when compared to Hearers differences may be considered significant.

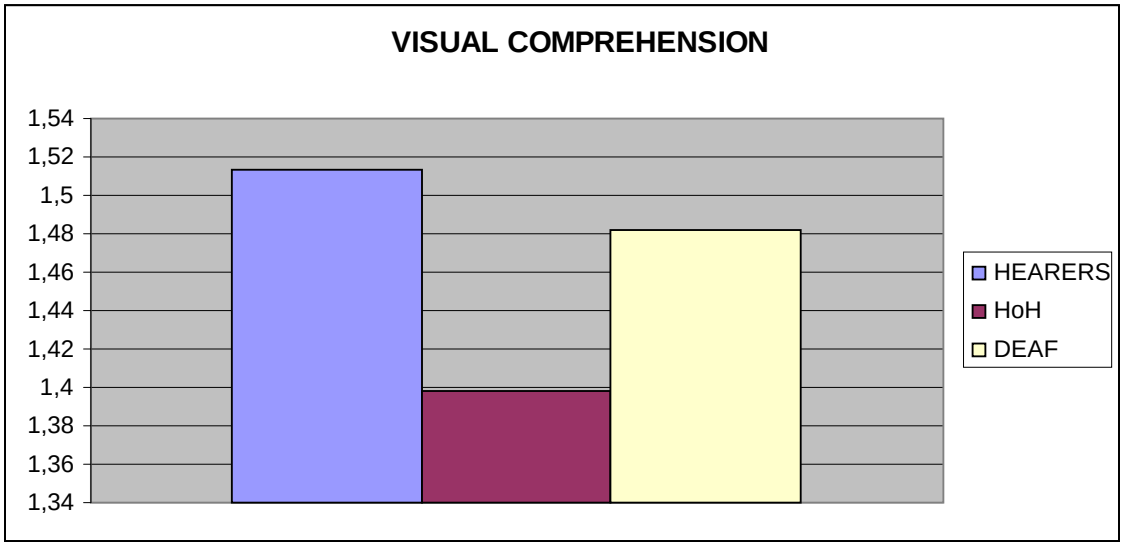
Analysing this information in more detail, we divided comprehension questionnaires into 3 different categories, focusing specifically on the three different aspects that integrate the audio-visual product and remain accessible to our target groups: image, text and the general meaning of the clip.

When it comes to Textual Comprehension, results differ considerably: comprehension remains similar for hearers (1.53), whereas the Hard of Hearing obtain poorer comprehension (1.18) and Deaf levels come under what we consider “partially correct / incomplete” (0.94).



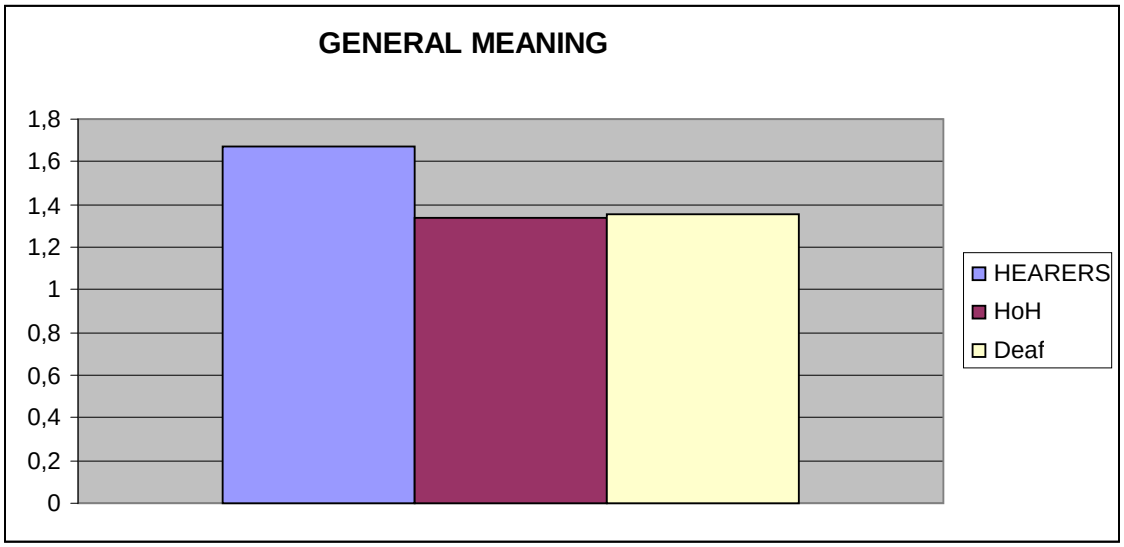


"Visual Comprehension" shows the most representative results, together with those of "Text Comprehension". In this case, comprehension decreases slightly under 1,6 for Hearers (1.51), whereas Deaf participants (1.48) show better results than the Hard of Hearing (1'39). This is worth-mentioning, because this is only field in which the Deaf obtain better results than the Hard of Hearing. Furthermore, it shows the best levels of comprehension for the Deaf.



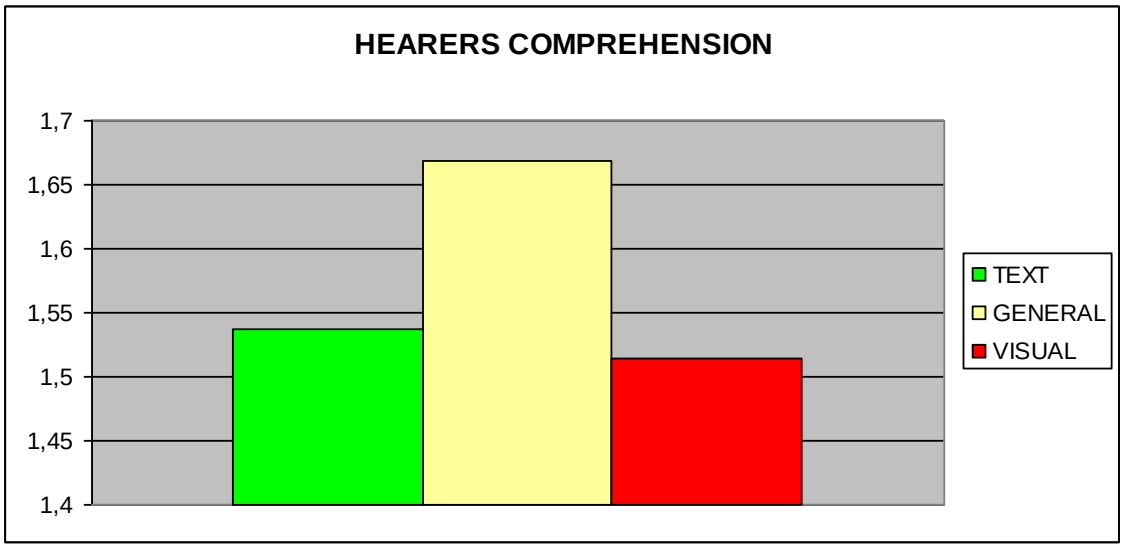
"General Meaning" analyses the comprehension levels of the scene considering elements not included within verbal and visual items. Questions included here show their understanding of social behaviour, double meaning and body language. In this case results are similar to those of "Global Comprehension".

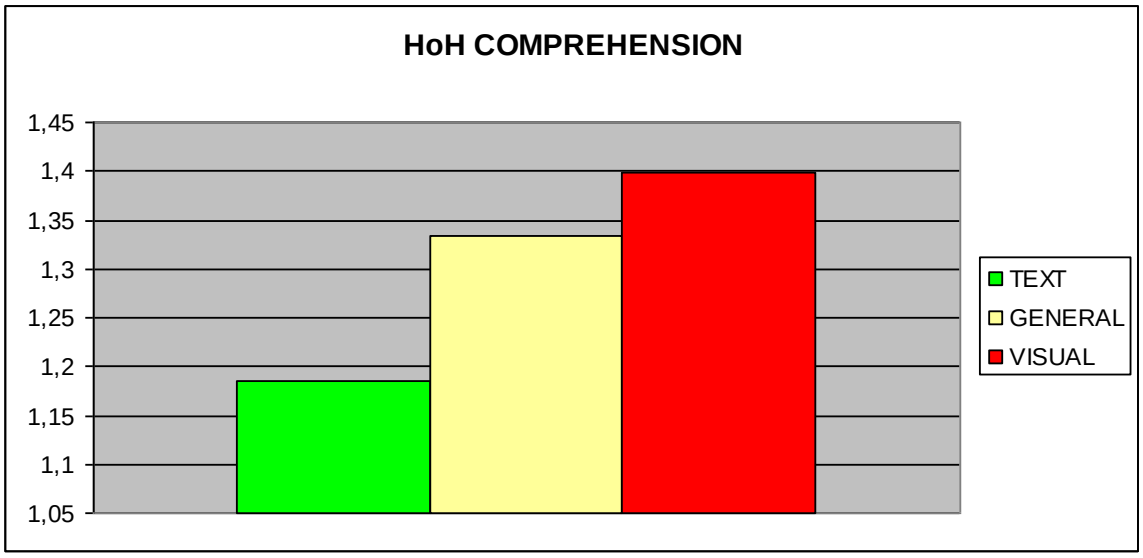
Hearers get a good average comprehension (1.66), whereas Hard of Hearing (1.33) and Deaf (1.35) obtain similar results.

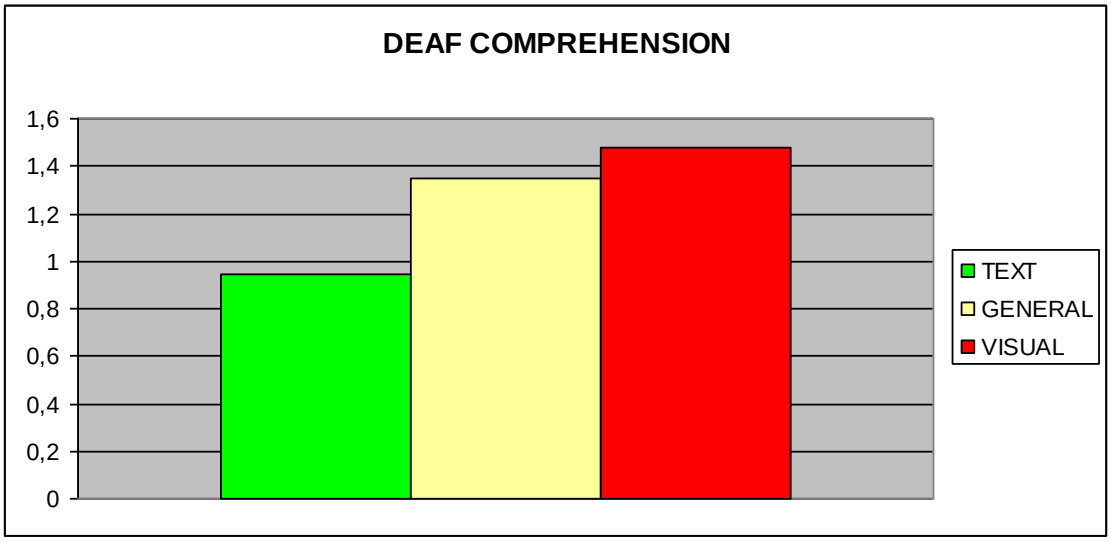


4.2.4.3 COMPREHENSION PER GROUP

Reviewing the data from a different perspective also illustrates some interesting findings







As we can see, Hearers obtain more information from the textual (1.53) and general content (1.66) of the clips (together with the aural track, not analysed in the present study), reaching 1.57 in overall comprehension.

On the other hand, Hard of Hearing and Deaf users get most of the information from the visual and general content (1.39 and 1.33 for the Hard of Hearing, and 1.48 and 1.35 for the Deaf). In both cases the information obtained is still poorer than that of the Hearers'.

Although the overall comprehension rates are similar (1.30 for the Hard of Hearing versus 1.25 for the Deaf), the main distinction for these two groups lies on the textual processing. While Hard of Hearing get an average textual comprehension of 1.19, Deaf participant did not even reach 1 (0.94). This highlights the difficulties deaf people face in understanding subtitled products.

With these data derived from the comprehension process and the help of the eye-tracker, we will now analyse how the audiovisual product in scanned and processed by the three groups. We will try to see how each group processes the information.

5 Interim Conclusions

At the time of writing this report tests are still underway, but the project team can already provide some comments on what has been observed, and some recommendations.

1 – For accessibility purposes a difference must be drawn between subtitling countries and dubbing countries (France, Germany, Italy and Spain). Special attention should also be paid to countries such as Poland where they neither subtitle nor dub but use lecturing/voice-over as their preferred mode "According to recent research (a poll by Inst. SMG KRC Poland, 2002) 50.2% of Poles prefer voice-over and 43.4% opt for dubbing; while subtitling is preferred by only 8.1%. A staggering 72.1% of Poles, when asked which type of AVT was the worst, chose subtitling. The latter is a standard in Polish cinemas. Intra-lingual subtitles seem to be gaining ground on Polish television in documentaries with authentic utterances played back from a low-quality recording, e.g. telephone conversations, and dubbed cartoons as well as certain commercials are gaining popularity, but documentaries and foreign films for television are voiced-over. This technique may be beneficial for foreign language learners, although subtitling is undoubtedly a better choice in this respect (Brett, unpubl.) and less costly than dubbing in that only one reader is hired, but its imperfections are many. Notwithstanding, it remains the main mode of transferring foreign programmes onto the Polish television market because of target audience expectations[2]."

2- The BBC achieved by 1 April 2008 almost 100% subtitling. This was achieved thanks to the technique of "subtitling by respeaking". Though the quality and accuracy of this type of subtitling is still to be improved subtitling by respeaking has proven to be a potent tool towards accessibility. In order to take on board this technique Speech Recognition (SR) Software must be available in the language used. Some commercial firms offer quality SR programmes, such as Dragon (Nuance) or ViaVoice (IBM), but for minority European languages there is no SR software available and its creation is not guaranteed. Hence one recommendation will be to create a pool of European languages SR software in order to promote 100% subtitling.

3 - The live subtitling exploratory study (by DR) confirmed that the delay in displaying the subtitles was a significant challenge to all the subjects who tried to use news items with live subtitles. The final results will discuss the various viewing strategies followed (including turning down the audio and focusing exclusively on the subtitles, or concentrating on the audio and using the subtitles as a last resort option where understanding was deficient.

[2] Bogucki, Lukasz (2004): "The Constraint of Relevance in Subtitling". The Journal of Specialised Translation: 69-85.
http://www.jostrans.org/issue01/articles/boguckien.htm#about [Retrieved 6/05/2009]

UAB Interim Conclusions Based on Pre test Questionnaires

4 - It seems evident that viewers get familiar with some stylistic elements in subtitling and seem reluctant to accept any innovative alternative, as it happens with sound information, where icons are not accepted and description is the preferred technique for Deaf and Hard of Hearing users.

5 - However, many elements that are currently been applied to current Subtitling for the Deaf and Hard of Hearing (SDH) are questioned by the target users, especially Deaf groups:

- Tags, not generally included in Spanish subtitling, seem to be the favourite option for deaf users, either alone or in combination with colours; whereas the Hard of Hearing prefer plain colour identification
- The generalised used of bottom placement, supported by the Deaf, would make mixed positioning – traditional in TV – disappear too
- Information conveyed by emoticons could also be omitted, as it seems deaf users can get this information from the visual content.
- The use of boxes makes no significant difference in terms of practices and preferences among the Deaf and / or the Hard of Hearing. Only Hearers, not generally exposed to teletext subtitling, seem to reject this option.

6 - As we can see, Deaf users would prefer current Spanish SDH to modify some parameters. With this project we will see how other countries' alternatives would be accepted in our society.

UAB Conclusions based on Post Test Questionnaires

7 - Final results reveal clear differences between the responses to pre and post-test questionnaires. In most cases users, influenced by real practices, change their minds showing their preference for habit.

8 - The main parameters in our analysis show how preferences among the Deaf and the Hard of Hearing are more similar when it comes to post questionnaires, and tend to differ when compared to the Hearers' opinions. Results in identification, box and emoticon tests are good examples of this coincidence. It is remarkable the fact that, in most cases, it is deaf individuals that change their mind considerably, in comparison to pre-tests, and match practices listed in the Spanish UNE-153010. This is also supported by the different results in Hearing groups and could be explained by their viewing habits: options selected are the ones also adopted by current practices: colour identification, boxes (due to the technical restrictions imposed by analogue teletext) and description.

9 - Another significant example is included in "Placement". Here, Deaf users pre-prefer bottom subtitles, matching their DVD viewing habits, whereas in post-preference tests, they also choose mixed positioning, also matching TV practices and UNE Standards. Distinctively, the option for mixed positioning is not supported by the Hard of Hearing, who opt for a homogeneous bottom placement in all cases, whereas pre-preferences show mixed results supporting both bottom and mixed displays.

10 - On the other hand, other elements obtain surprising results: information description, analysed under "Icons", shows how the Hard of Hearing, originally preferring description, would not even require sound information representation in 50% of cases. This seems surprising, when not even Hearing users are for this option at such a high rate. The reading skills of the Hard of Hearing, higher than those of the Deaf, together with their varying residual hearing, could somehow explain this point.

11 - Finally, together with "placement" and "emoticons", "subtitling speed" shows further examples on the discrepancies among the Hard of Hearing: originally massively for verbatim subtitling, when it comes to reading practices, standard subtitles seem to be a good option in terms of comprehension. That would again represent how preferences do not match requirements in some cases.

6 Outreach to User Associations

The project as a whole is in touch with users' associations. This constant contact serves to inform the manner in which the DTV4All project has been pursued. One example of this is that RNIB has issued a report about the reception of Bollywood films with Audio Description which has been drawn upon in drafting a general DTV4All questionnaire on Audio Description.

7 Appendix: TV3 Audiodescription Questionnaire

CUESTIONARIO:

1 . ¿Cómo preferís hacer la encuesta?
a . En catalán.
b. En castellano.

2. ¿En qué franja de edad os encontráis?
a. De 18 a 24.
b. De 25 a 34.
c. De 35 a 44.
d. De 45 a 54.
e. De 55 a 64.
f. De 65 a 74.
g. De 75 a 84.
h. Más de 85 años.

3. ¿Cuál es vuestro sexo?
a. Hombre.
b. Mujer.

4. ¿Cuál es vuestra localidad de residencia?
Pregunta abierta

5. ¿Con cuál de las siguientes frases os identificáis más? (Elegid sólo una)
a. Hablo y entiendo perfectamente el catalán.
b. Entiendo el catalán perfectamente, pero no lo hablo.
c. Tengo dificultades para entender el catalán.
d. No entiendo nada el catalán.

6. ¿Cuál de las siguientes frases describe mejor vuestra capacidad para ver? (Elegid todas las que sean pertinentes)
a . Veo lo suficientemente bien como para reconocer a un amigo que va por la otra acera de la calle.
b. Veo lo suficientemente bien como para reconocer a un amigo que está al otro lado de una habitación.
c . Veo lo suficientemente bien como para reconocer a un amigo que si estiro el brazo lo puedo tocar.
d . Veo lo suficientemente bien como para reconocer a un amigo si me acerco a su cara.
e. Veo la forma de los muebles de una habitación.
f. Durante el día, puedo decir dónde están las ventanas de una habitación gracias a la luz del sol.
g. No veo nada.
h. Prefiero no decirlo.
Notas:

7. ¿Tenéis reconocida la ceguera total o la ceguera parcial? (Elegid una opción)
a . Ceguera total.
b. Ceguera parcial.
c . Ninguna.
d . No lo sé.
Notas:

8. ¿Cuál de los siguientes productos habéis consumido alguna vez con audiodescripción? (Elegid todas las opciones que sean pertinentes)

a. Televisión. ¿Cuál?
b. Películas en el cine. ¿Dónde?
c. DVDs. ¿Cuáles?
d. Ópera. ¿Dónde?
e. Teatro. ¿Cuál?
f. Museos. ¿Cuál?
g. Exposiciones. ¿Dónde? ¿Cuál?
h. Espectáculos deportivos. ¿Cuál?
y. Patrimonio natural. ¿Dónde?
h. Otras...

9. ¿Cuál es vuestra fuente de información sobre los productos diseñados especialmente para ciegos y personas con discapacidad visual? Especificad en qué medios. (Elegid todas las opciones que sean pertinentes)
a . Diarios y revistas.
b. Internet.
c . Radio.
d . Televisión.
e. Amigos y familiares
f. ONCE
g. Associació Catalana de Cecs
h. Mi ayuntamiento u organizaciones de servicios sociales
y. Otras organizaciones locales
j. Revistas especializadas, por ejemplo la de la ONCE o de la Associació Catalana de Cecs
k. Diarios hablados
l. Otros.

10. ¿Cómo os enteráis de la programación con audiodescripción de TV3? (Elegid todas las opciones que sean pertinentes)

a. Me lo dice algún amigo o familiar.
b. Lo miro yo, en la web de TV3
c. Lo miro yo, en el teletexto.
d. Lo miro yo, en otras páginas web de Internet. ¿Cuáles?
e. Por medio de boletines de alguna asociación. ¿Cuál?
f. Otros...

11. ¿Con cuál de las siguientes frases os identificáis? (Elegid todas las opciones que sean pertinentes)

a. Me resulta difícil saber cuál es la programación audiodescrita de TV3 y necesito de ayuda externa.
b. No me resulta difícil saber cuál es la programación audiodescrita de TV3 y la consigo a solas.
c. Tengo dificultades para activar la audiodescripción por el canal de la TDT y necesito ayuda externa.
d. No tengo dificultades para activar la audiodescripción por el canal la TDT y lo hago a solas.

12. ¿Qué propondríais por mejorar el acceso a la programación audiodescrita de TV3?
Respuesta abierta

13. (Elegid todas las opciones que sean pertinentes). Cuando veis la televisión:
a . Tengo dificultades para ver los botones del mando a distancia.

b. Tengo dificultades para ver las imágenes a la pantalla.
c . Tengo dificultades para ver los detalles a la pantalla.
d . Tengo dificultades para ver el texto a la pantalla
e. Veo la luz que emite la pantalla.
f. No veo nada en la pantalla.
g. No tengo dificultades para seguir lo que sale en la pantalla.
h. Otros...

14. (Elegid todas las opciones que sean pertinentes) Cuando veis un programa o una película en la televisión:
a . Utilizo la visión residual que tengo.
b. Me pongo gafas especiales de más graduación.
c . Me acerco a la televisión.
d . Utilizo una lupa.
e. Ajusto la configuración de la pantalla.
f. Regulo la luz de la habitación.
g. Utilizo una televisión de pantalla grande.
h. Pido a amigos o familiares que me ayuden explicándome lo que pasa en la pantalla.
i. Intento entender tanto cómo puedo sólo con el sonido de la película o del programa.
j. Utilizo la audiodescripción, siempre que hay, para que me explique lo que pasa en la pantalla.
k. No hago nada de todo esto.
l. Nunca veo la televisión.
M. Otros...

15. ¿Cuánto tiempo dedicáis a ver la televisión? (Sólo una respuesta)
a. Cada día, más de dos horas.
b. Cada día, entre una y dos horas.
c. Cada día, menos de una hora.
d. Unas cinco veces a la semana.
e. Unas tres veces a la semana.
f. Unas dos veces a la semana.
g. Una vez cada dos semanas.
h. Menos de todo esto.

16. ¿Qué tipo de programas veis en la televisión? (Elegid todas las opciones que sean pertinentes)
a. Informativos
b. Debates
c. Documentales
d. Películas
e. Magazines
f. Series
g. Dibujos animados
h. Programas de humor

17. ¿Soléis ver la programación con audiodescripción que emite TV3? (Sólo una opción)
a. Sí.
b. No, no sabía que TV3 emitía programación con audiodescripción.
c. No, sé que TV3 emite programación audiodescrita pero no sé como activarla.
d. No, porque todavía no recibo la TDT, pero me gustaría verla.
e. No, no necesito la audiodescripción.

18. ¿Cuál de las siguientes frases se ajusta más a lo que pensáis? (Elegid sólo una)
a. Tendría que haber más programación audiodescrita en TV3
b. La programación audiodescrita en TV3 es suficiente.

c. No haría falta que TV3 emitiera programación audiodescrita.

19. ¿Qué programación con audiodescripción de TV3 habéis visto alguna vez?
a . La Gran Pel·lícula.
b. Doraemon
c. Series juveniles como por ejemplo "Els desastres del rei Artús", "Em dic Eve" o "L'hotel zombi".

20. Según vuestra opinión, completad las frases siguientes con una de las opciones que se os ofrecen:

a. Teniendo en cuenta que el espacio disponible es limitado, las audiodescripciones...
1. tendrían que incluir más información.
2. tendrían que incluir menos información.
3. suelen incluir la información necesaria.

b. Las audiodescripciones...
1. suelen estar demasiado cargadas, faltan espacios de silencio.
2. suelen ser demasiado concisas, sobran espacios de silencio.
3. suelen encontrar un equilibrio entre silencio y diálogo.

c. La información que se transmite en las audiodescripciones...
1. debería ser más detallada.
2. debería ser menos detallada.
3. suele ser adecuada.

d. La narración de las audiodescripciones...
1. debería ser más emotiva.
2. debería ser más neutra.
3. suele ser adecuada.

e. Las audiodescripciones...
1. a menudo se oyen demasiadas fuertes.
2. a menudo se oyen demasiadas flojas.
3. se suelen oír bien.

f. Cuando hay canciones habladas en otras lenguas...
1. Preferiría escucharlas en versión original.
2. Preferiría escuchar la traducción, siempre que haya subtítulos.
3. Preferiría continuar escuchando detalles del programa a través de la audiodescripción, aunque ésta no fuera indispensable para poder seguir el argumento.

21. ¿Qué propondríais por mejorar las audiodescripciones de TV3?
Pregunta abierta

22. Si TV3 tuviera que aumentar su programación con audiodescripción, ¿qué programas preferiríais que se audiodescribieran? (Elegid tres como máximo)
a. Informativos
b. Debates
c. Documentales
d. Más películas
e. Magazines
f. Series
g. Dibujos animados
h. Programas de humor

23 . Algún otro comentario

Futuros estudios sobre la audiodescripción de TV3.

TV3 prevé llevar a cabo más estudios sobre el servicio de audiodescripción. ¿Estaríais interesados en participar?

1. Sí.
2 . No.

Por favor, déjanos un nombre, un correo electrónico o un teléfono por poder ponernos en contacto de cara a próximos estudios.

Gracias por vuestro interés.

Departament d'Accesibilidad de TV3.