

Gains and losses of watching audio described films for sighted viewers

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Audio description (AD) is a unique form of communication that guarantees access to audiovisual material for blind people through an additional verbal commentary that describes relevant visual cues. In spite of its original purpose and target audience, some scholars and some guidelines maintain that AD can be useful for other sectors of the population, and suggest that sighted viewers could usefully listen to AD when ‘watching’ a film with blind people. In order to determine whether AD affects the sighted viewer’s cognitive performance and appreciation of the film, and whether AD can be exploited as an integration tool allowing blind and sighted users to mingle when ‘watching’ a film, we assessed the effect of AD on sighted viewers ($n = 125$, 18-28 years) empirically. Results suggest that the addition of AD to films does not negatively affect the cognitive aspects of the viewing experience (i.e., general understanding and film scene recognition), nor does it dramatically affect its overall enjoyment, whereas listening to AD without the visuals poses some challenges to sighted viewers.

Keywords: audio description, blind, sighted, film, audiovisual translation, empirical, cognitive, evaluative, integration

1. Introduction

This paper describes an empirical study aimed at testing the cognitive and evaluative effects of audio description (AD) on sighted viewers. According to recent studies on the reception of audiovisual translation (AVT) (d’Ydewalle and De Bruycker 2007; Wissmath et al. 2009; Perego et al. 2010, 2015; Lavaur and Bairstow 2011; Fryer and Freeman 2012, 2014), cognitive effectiveness refers to the degree to which viewers understand and remember the content of a film and its pictorial details. On the other hand, the evaluative effects of film viewing entail the degree of pleasure, general appreciation, enjoyment and lack of effort experienced

during the film experience. A successful film viewing experience is at the same time cognitively effective and pleasant. We know that AD is effective for blind and visually impaired people (henceforth VIPs). However, to date, there is only limited evidence on the effects of AD on sighted viewers. Knowing whether sighted viewers are able to cope with AD successfully, however, is relevant because it can tell us whether sighted viewers and VIPs can enjoy each other's company more often when 'watching' films with AD together, and it can shed light on the feasibility of extending the uses of AD beyond its original purpose and target audience. In the paper, after outlining the benefits of AD for VIPs and showing its potential extended uses, we will describe an empirical study aimed at assessing the cognitive and evaluative effects of AD on sighted viewers. Then, we will discuss the results of the study with respect to our original hypotheses.

1.1 AD and its benefits for VIPs

Audio description, also known as video description and described video (Piety 2003, 2004), is an assistive inclusion service that enables VIPs to access visual arts and media more efficiently (Piety 2003; Remael et al. 2015). AD is a form of communication, and it is "used by people who have different perceptual abilities, but are members of the same speech communities" (Piety 2003, 2). In practice, when used to make films accessible, AD translates the visuals into an oral narrative: "the visual made verbal" (Snyder 2007, 99). The aural narrative is added in the pauses in the film dialogue, and it interacts with the film to form a new coherent text (Cronin and King 1990; Piety 2003, 2004; Remael et al. 2015). Ideally, AD substitutes the images that a sighted viewer enjoys during film viewing with an equally vivid verbal rendering, as, for instance, in the case of the opening scenes of *Marie Antoinette* (S. Coppola, 2006):

A girl in a white powdered wig, feathered head and a white petticoat, reclines on a chaise longue, with a maid fitting her a pair of slippers. The girl idly takes a finger full of pink pudding and licks it. She looks up as if aware of the camera, and gives a faint angelic smile.

AD is a form of intersemiotic translation (Jakobson [1959] 2000) as it deals with two completely different codes, translating visual semiotic signs into acoustic verbal signs. Along with subtitling for the deaf and hard of hearing, AD is an example of an accessible AVT method making audiovisual texts accessible to people with sensory impairments (Braun 2008).

AD is designed to provide enough information, concisely and objectively, for VIPs to follow a story told by a film, without explicating obvious information (Salway 2007). It is also meant to fulfil the criteria of usability and experiential

equivalence: AD enhances the ease of use of the audiovisual products and it attempts to make the film experience of VIPs equivalent (or at least comparable) to the sighted audience's (Piety 2003, 18; Remael et al. 2015, 18).

Introduced in the 1970s, AD has provided increased television access, freedom and cultural independence to both older and younger VIPs, thus improving their quality of life. Both earlier and more recent surveys and empirical studies on its effects demonstrate its benefits and potential. From the early stages of its introduction on television in the US, VIPs have exhibited an overall positive reaction to the service. Far from perceiving it as obtrusive, VIPs consider AD a means to make programmes more interesting and informative, an aid to increase their understanding of key elements in the plot of a film, and a means to enjoy the film or programme more (Frazier 1975; Peli et al. 1996; Schmeidler and Kirchner 2000). In fact, not only does AD enhance the comprehension of VIPs, but it also enables them to perform as well as sighted viewers – and in some cases even to outperform them – on comprehension tests (Frazier and Coutinho-Johnson 1995; Packer 1996; Peli et al. 1996; Schmeidler and Kirchner 2001). This holds even when specific AD styles (i.e., cinematic vs. standard)¹ are tested (Fryer and Freeman 2012, 2013). Recently, it has been demonstrated that AD increases the sense of immersion² of VIPs (Fryer and Freeman 2012, 2013) and it helps them to experience the emotional content of audiovisual products (Fryer and Freeman 2014). Due to AD, VIPs feel more connected to their sighted peers and more comfortable talking about audio described products with them. Given its cognitive, social and psychological benefits, AD is experienced as a powerful aid against isolation and towards social integration, and it has become an invaluable asset for a large section of the visually impaired population worldwide (Cronin and King 1990; Packer 1996; Piety 2003; Schmeidler and Kirchner 2000).

1.2 Potential extended uses of AD: the literature to date

Originally meant exclusively for VIPs (e.g., Frazier 1975; Cronin and King 1990), AD is thought to have potential also for other audiences. Some authors and some guidelines support, on a largely conjectural basis, the idea that users without visual

1. Cinematic AD is a type of AD that uses filmic terms referring to editing, *mise-en-scène* and cinematography. For instance, in the AD of Hitchcock's *The Lady Vanishes* (1938) by CaptionMax: "Now, in black and white footage, a mountain top view looks down over a village nestled in foothills," or further on: "The camera pans from the depot to a small village."

2. A term referring to strong emotional involvement and reactions toward media exposure. For details on the notion of immersion, which traces back to the studies of the Hungarian psychologist Mihaly Csikszentmihályi, see Wissmath et al. (2009).

impairment could benefit from AD (e.g., ADLAB 2012, 9; ADP 2009, 3; AENOR 2005, 6; Remael et al. 2015, 17). According to these sources, potential sighted audiences would include both vulnerable and regular users. For instance, the *French Audio Description Charter* (Morisset and Gonant 2008, 1) maintains that AD could be used successfully by

elderly people whose cognitive capacities are diminishing;³ sick people who are sometimes bothered by the rapidity of the moving image; foreigners who are learning the language; and [...] anyone who can see but who wants to listen to a film without looking at it (while driving, for example).⁴

The blind director of Senza Barriere,⁵ the major Italian AD provider, provokingly claims that to promote social integration and to emphasize the sociable (vs. solitary) nature of film watching, sighted viewers could listen to audio films – audio described films delivered without images⁶ – and watch audio described films with VIPs more often. Nowadays, however, it seems to be more common that the two groups watch films separately, or that VIPs ‘watch’ films without AD when they are with their sighted counterparts (Busarello 2013). In fact, in some countries, it is not always possible for VIPs alone to listen to the AD when they ‘watch’ a film with sighted viewers, for instance, at the cinema – not all cinemas are equipped to offer AD through headphones or other devices – or at home (ADLAB 2012).

In spite of the benefits that AD provides to VIPs, it is still unclear what effect AD would have on sighted viewers: would AD disturb them? To date, empirical

3. Cf. Ofcom (2010, 9).

4. Cf. Dosch and Benecke (2004); Remael and Vercauteren (2011).

5. Senza Barriere is an Italian nonprofit-making social cooperative that develops multimedia support and access for VIPs. Since 2004, it has distributed a substantial number of audio films (see note 6) on a hire basis to Italian blind and partially sighted persons. Senza Barriere promotes access to cultural heritage through audio description and other services in a country where at the time of writing the number of audio described DVDs commercially available is around 5 (vs. Germany with over 130, and the UK with over 500) (ADLAB 2012).

6. Audio described films and audio films are different products. The former are films that include an extra audio track with an audio description interwoven with the film dialogues and the whole semiotic ensemble of the film. Audio films, on the other hand, are audio tracks that do not include the video. In Italy, they are produced at and dispatched from Senza Barriere, who favour them because they are easier to carry around and because removing the image from the final product enables the copyright procedures to be overcome more swiftly. In spite of this choice, of the technical differences between the two products and of their different inclusive potential, Senza Barriere’s AD guidelines (Busarello and Sordo 2011) are in line with other European official guidelines (cf. Rai et al. 2010) and thanks to their representativeness they contributed to the creation of the recently released European AD recommendations (Remael et al. 2015).

research on the effect of AD on sighted users is so limited or incomplete that it is not yet possible to give a definite answer.

A survey on sighted viewers who had been watching AD for a year with their visually impaired families shows that they did not find AD obtrusive (Cronin and King 1990), which is confirmed in more recent research (Fryer and Freeman 2013, 8). Not only do sighted viewers tolerate AD well, but they also seem to benefit from it in some circumstances. In their eye-tracking studies conducted on children (age 8-9), Krejtz I. et al. (2012) and Krejtz K. et al. (2012) showed that the addition of AD to educational films facilitates knowledge and vocabulary acquisition. In fact, AD positively guides the attention of viewers towards the described objects and provides them with specialized vocabulary presented in context without interfering with the recognition of the film scenes. Similarly, Szarkowska et al. (2013) showed that teenagers (age 15-17) exposed to audio described works of art focused significantly longer on the described elements in the painting, which functioned as an aid to developing their visual literacy.

These studies contribute to providing preliminary results on the effect of AD on sighted viewers, and they seem to confirm that, in general terms, AD does not pose major challenges to regular audiences. However, these studies are too few to enable us to generalize their results, and they suffer from some methodological flaws. These range from inadequate stimuli (e.g., very short video-clips) to the fact that these studies focus only on the cognitive outcomes of watching videos with AD and overlook the degree of involvement of the participants in the viewing activity. Consequently, the question as to whether AD can be used successfully by people other than VIPs is still open (Piety 2003, 20; Schmeidler and Kirchner 2001, 208).

1.3 Hypotheses and research questions

To overcome at least some of the limitations of previous research, we decided to carry out a comprehensive study simultaneously assessing the cognitive and the evaluative effectiveness of AD on sighted viewers. There is no empirical evidence to demonstrate whether AD overloads sighted viewers and whether it compromises their enjoyment of the film. Therefore, our primary aim was to assess 1) whether AD interferes with sighted viewers' comprehension, memory and enjoyment of the film; 2) whether the attitude of sighted viewers towards AD is positive or negative; 3) whether AD without images (e.g., audio films) is totally disruptive for sighted viewers; 4) whether AD can really be used as an integration tool allowing VIPs and sighted users to mingle when 'watching' a film.

The secondary aim of the study was to assess which concrete benefits – if any – sighted audiences can reap from AD (e.g., based on dual coding theories,

strong word-picture association, enhanced memory for words or for visual details) and therefore whether AD can be used in alternative settings, as other forms of AVT currently are.

2. An experiment on the effects of AD on sighted viewers

To achieve our aims, we carried out a study assessing an array of cognitive and evaluative measures. The cognitive tests included measures of performance on gist comprehension, recognition of visual details expressed verbally, and visual scene recognition. The evaluative tests included film appreciation, self-reported effort during film viewing, and assessment of memory. In the experiment, viewers (total $n = 125$) were exposed to one of three conditions: one group ($n = 40$) watched the standard film, one group ($n = 49$) watched the film with AD, and one group ($n = 36$) listened to the AD in a blindfolded condition (see section 3.3 below). In particular, we wanted to operationalize our four research questions (see section 1.3, above) by gaining empirical evidence on:

1. whether there is a statistically significant difference in gist comprehension among groups exposed to different conditions, and if so, which group performs better;
2. whether there is a statistically significant difference in the recognition of visual details expressed verbally among groups, and if so, which group performs better;
3. whether there is a statistically significant difference in the recognition of film scenes among groups, and if so, which group performs better;
4. whether a better performance in visual recognition is related to the way in which visual details are presented (i.e., visually, verbally, or visuo-verbally);
5. whether verbal and visual redundancy help sighted viewers in recognition tasks;
6. whether there is a significant difference in film appreciation, self-reported effort and assessment of memory among groups.

We also administered a specific questionnaire on AD to people who listened to the AD with and without the visuals to gain information on their perception of AD (see section 3 for details on the AD questionnaire). We capitalized on previous research on the processing effectiveness of AVT and we constructed our study design and materials based on Perego et al. (2010, 2015) (see also Lavaur and Bairstow 2011; Wissmath et al. 2009). We adapted the questionnaires – originally intended to test the effectiveness of dubbing and subtitling – to make them suitable for an analysis of AD.

3. Method

3.1 Participants

The study is based on a sample of 125 undergraduates (92 females and 33 males, age range 18-28 years, $M = 20.73$, $SD = 2.09$) from the University of Trieste, Italy. The original sample included more participants, but we discarded participants who were older than 30 years of age or with an inadequate knowledge of Italian. Participants were all fully-sighted, and they obtained credits for their participation in the experiment. Participants who listened to AD during the experiment (watching the visuals or blindfolded, $n = 85$) did not differ in their familiarity with it ($t(83) = 1.48$, $p = .14$): they were not acquainted with AD; 53% stated that they *never* watch audio described films, 28% watch them *very seldom* and 14% *occasionally*.

3.2 Materials

3.2.1 *The audiovisual material*

The 10-minute film excerpt used in the experiment featured the opening scenes of the classic Italian comedy *Bianco Rosso e Verdone* (1981). In the excerpt, three men with different stories and personalities played by the same actor are driving back to their hometowns to vote on Election Day. The choice of this clip was determined by the co-presence of humorous spoken and unspoken scenes, which means that the different scenes pose different challenges for the AD and the user. Furthermore, part of the humorous content of the excerpt is conveyed through the visual track in combination with a musical background, and it does not rely on verbal language. The AD was provided by Senza Barriere (cf. note 5 and note 6). The AD was performed according to the Italian cooperative's in-house guidelines (Busarello and Sordo 2011), which are comparable with those that existed on the EU and the US markets at the time of the experiment. The original audio track of the film was substituted with the AD of Senza Barriere to obtain a standard AD film excerpt assembled specifically for the analysis.

3.2.2 *Questionnaires and tests*

Questionnaires and tests were specifically created to measure the main dependent variables of the study, relating to cognitive measures (measures of performance on gist comprehension, recognition of visual details expressed verbally, film scene recognition) and evaluative measures (film appreciation, self-reported effort and assessment of memory). Responses were all self-paced.

3.2.2.1 Cognitive measures. Questionnaire on gist comprehension. The gist comprehension measure was a 10-question multiple-choice questionnaire on the general content of the video. For each question, participants were asked to complete a statement by selecting a response from a list of three items including a correct response and two distracters (ex.: The protagonist’s day begins ...; possible answers: in the hustle and bustle/with a series of unexpected mishaps/in a perfectly organized manner). The final score ranged from 0 to 10 and it was calculated by adding up the number of correct responses.

Test for the recognition of visual details expressed verbally. The test was administered to all groups, namely, the people who accessed visual details only visually (standard group), both visually and verbally (AD group), or only verbally (blindfolded group). The test was a multiple-choice questionnaire that appraised the ability to remember specific visual details when they were described verbally. The visual details selected for testing were all present in the AD, and the words

	<p style="text-align: center;">0.00.30 – 0.00.50</p> <p>Due lunghe corna e un ferro di cavallo sono legate con un nastro rosso alla griglia scalfita di un vecchio camion. Tra le numerose immagini sacre attaccate al parabrezza spicca quella di San Cristoforo. Un cinquantenne con la barba già bianca fuma guidando. I tergicristalli lavorano per liberare i vetri da una pioggia non forte, ma insistente.</p> <p>[Two long horns and a horseshoe are tied with a red ribbon to the scratched grill of an old truck. Among the many sacred images attached to the windshield stands St. Christopher. An already white bearded middle-aged man smokes while driving. The wipers are working to free the glass from rain that is not strong, but persistent.]</p>
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Figure 1. Visual detail of *Bianco Rosso e Verdone* with Italian AD and English back translation; the exact wording of the AD was used in the test on the recognition of visual details expressed verbally

3.2.2.2 *Evaluative measures.* This questionnaire aimed at assessing the overall evaluation of the film viewing experience using direct and indirect measures. The respondents specified their answers to each question of the questionnaire on a 7-point Likert scale. The respondents were asked to express their appraisal on the degree of film appreciation (3 items referring to the degree of appreciation and involvement with the film and the willingness to see the whole film, with a maximum score of 21), and their self-reported effort during film viewing (3 items). The questionnaire also assessed the metacognitive judgments of memory and comprehension of the participants (2 items with a maximum score of 14). These items referred to the self-assessed capacity of the participants to remember the general information from the film clip and their self-assessed capacity to recognize specific visual items that were contained in the film and described in the AD.

3.2.2.3 *Questionnaire on AD.* The questionnaire on AD was administered only to the participants who listened to the AD. The questionnaire included one question assessing whether the participants had already experienced AD, and ten questions measuring the attitude of participants towards several aspects of AD (e.g., level of formality, rate and smoothness of delivery, etc.), including how *helpful/disturbing*, *easy/difficult* to follow, *pleasant/unpleasant* to listen to the AD was (Table 2).

3.3 Design and procedure

We tested the effect of the film format in a between-subjects design. The same video was presented in one of three formats to participants randomly assigned to three groups. One group ($n = 40$) watched the plain video excerpt, one group ($n = 49$) watched the video with AD, and a blindfolded group ($n = 36$) listened to the AD without video. Throughout the paper we will refer to the first group with the label *standard group*, we will refer to the second group with the label *AD group*, and we will refer to the third group with the label *blindfolded group*.

We informed participants that the study was on film watching. We did not warn them about the presence of AD or the possible absence of the video track. They knew that a questionnaire would be administered after they had watched the video. Each group of participants was shown the video excerpt in one of the three conditions in a group viewing session. Participants were simply asked to watch the film excerpt and they were not asked to perform any specific task during the session, nor were they asked to pay attention to any specific aspect of the clip. After watching/listening to the excerpt, they were administered the paper-and-pencil questionnaire package. The tests were administered in the following order: 1) evaluative questionnaire; 2) questionnaire on AD; 3) cognitive questionnaires (*i.* recognition of visual details expressed verbally, *ii.* gist comprehension, *iii.* visual

scene recognition). Finally, participants supplied anonymous socio-demographic data.

4. Results

4.1 Cognitive Measures

Our analysis was designed to measure differences between groups regarding an array of cognitive measures, namely, gist comprehension, recognition of visual details expressed verbally, and recognition of visual scenes. Data were analyzed by creating a summative performance score for each cognitive measure. One-way Analysis of Variance (ANOVA) was used to analyze data for gist comprehension and recognition of visual details expressed verbally, integrated by post-hoc Tukey's HSD tests; a t-test was used for the recognition of visual scenes; Table 1 gives means and standard deviations for each measure.

4.1.1 *Gist comprehension*

Statistically significant differences were recorded among groups ($F(2, 122) = 5.57$, $p = .005$). Results show that the blindfolded group performed less well ($M = 7.67$, $SD = 2.04$) than the other groups (standard: $M = 8.92$, $SD = 1.60$; AD: $M = 8.55$, $SD = 1.43$) in understanding the general plot of the film clip. Post-hoc comparisons between groups were calculated with Tukey's HSD test. They show that there was a significant difference in the general comprehension of the film between the standard and the blindfolded group ($p = .004$, HSD test) and between the AD and the blindfolded group ($p = .047$, HSD test), whereas there was no difference between the standard and the AD group ($p = .55$, HSD test).

4.1.2 *Recognition of visual details expressed verbally*

Groups show significant differences in the recognition of visual details expressed verbally ($F(2, 122) = 15.41$, $p < .001$). Results show that the AD group were better able to remember visual details expressed verbally ($M = 17.92$, $SD = 1.59$). The standard ($M = 15.62$, $SD = 1.94$) and the blindfolded group ($M = 15.78$, $SD = 2.99$) show a similar, slightly worse performance. Post-hoc comparisons between groups show that there was a significant difference in the recognition of the film's visual details expressed verbally between the standard and the AD group ($p < .001$, HSD test) and between the AD and the blindfolded group ($p < .001$, HSD test), whereas there was no significant difference between the standard and the blindfolded group ($p = .95$, HSD test).

4.1.3 Recognition of visual scenes

Data were analyzed by creating a summative performance score for image recognition only for the two groups who watched the video track. A t-test was conducted to compare visual scene recognition scores in the standard and in the AD groups. Results show that there was no evidence of a difference ($t(87) = 1.98, p = .96$) between the two groups (standard: $M = 27.97, SD = 1.34$; AD: $M = 27.96, SD = 1.62$). The addition of AD did not affect the recognition of visual images. Both groups performed equally well.

Table 1. Descriptive statistics for the dependent variables of the study

		Standard		AD		Blindfolded	
		<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)
Cognitive measures							
General comprehension	*	8.92	(1.60)	8.55	(1.43)	7.67	(2.04)
Visual detail recognition	*	15.62	(1.94)	17.92	(1.59)	15.78	(2.99)
Image recognition		27.97	(1.34)	27.96	(1.62)		
Evaluative measures							
Film appreciation	*	5.45	(1.05)	4.95	(.95)	4.60	(.83)
Self-reported effort	*	5.89	(.62)	5.46	(.72)	5.19	(.74)
Judgments of memory		5.26	(.72)	4.91	(.77)	4.93	(.72)

Note. Ranges of scores for cognitive measures were: 0-10 for general comprehension, 0-20 for visual detail recognition and 0-30 for image recognition. Scores for evaluative measures show the average evaluation reported on a 7-point Likert scale.

* $p \leq .005$

4.2 Evaluative measures

Our analysis was also designed to measure differences between groups regarding film evaluation. The average score given on a 7-point Likert scale for each aspect of evaluation (i.e., film appreciation, self-reported effort, assessment of memory) was used as a measure for the three indices. Table 1 gives means and standard deviations for each index.

The results of the one-way Analysis of Variance (ANOVA) show that the three groups responded in a significantly different way to the questions on film appreciation ($F(2, 122) = 7.59, p < .001$) and self-reported effort ($F(2, 122) = 9.81, p < .001$), while a difference approaching significance was observed regarding their assessment of memory ($F(2, 122) = 2.81, p = .064$).

The standard group appreciated the film *quite a lot to a lot* ($M = 5.45, SD = 1.05$), whereas the other groups show slightly weaker appreciation. The AD

group appreciated the film *quite a lot* ($M = 4.95$, $SD = 0.95$) and the blindfolded group was *indifferent* to it ($M = 4.60$, $SD = 0.83$). Post-hoc comparisons between groups show that there was no significant difference between the average evaluation scores of the groups exposed to AD irrespective of the presence of the video track ($p = .222$, HSD test); the evaluations were significantly different between the standard and the blindfolded group ($p = .001$, HSD test), and significant between the standard and the AD group ($p = .042$, HSD test).

Regarding the self-reported effort in following the film, the standard group said they found it *easy* ($M = 5.90$, $SD = .62$), the AD group said they found it *quite easy* to *easy* ($M = 5.46$, $SD = .72$) and the blindfolded group said they found it *quite easy* ($M = 5.19$, $SD = .74$). The Tukey's HSD test shows that there was a significant difference in self-reported effort between the standard and the blindfolded group ($p < .001$, HSD test), whereas there was no significant difference in self-reported effort between the standard and the AD group ($p = .013$, HSD test). There was no significant difference in self-reported effort in the groups exposed to AD irrespective of the presence of the video track ($p = .180$, HSD test).

Finally, regarding the participants' assessment of memory – that is, their reported ability to remember visual details and general information from the film – a difference approaching significance between the groups was found ($F(2, 122) = 2.81$, $p = .064$). All groups said they could remember both features *quite accurately* (standard: $M = 5.26$, $SD = .72$; AD: $M = 4.91$, $SD = .77$; blindfolded: $M = 4.93$, $SD = .72$). Tukey's HSD test shows that the only difference approaching significance could be observed between the standard and the blindfolded group ($p = .081$, HSD test).

4.3 Questionnaire on AD

A questionnaire on AD was administered to the AD and the blindfolded group. As shown in Table 2, the two conditions did not have a significantly different effect on the two groups. A statistically significant difference between the two groups was observed only in their ability to follow the AD, in their assessment of the AD voice adequacy, and in the AD reported helpfulness. Indeed, the blindfolded group reported to have followed the AD almost *a great deal*, whereas the AD group felt they had managed to follow it *neither a little nor a lot*; the blindfolded group found the AD voice *adequate*; finally, it was the AD group who found the AD *very helpful* to understand the whole film rather than the blindfolded group, who found it just *reasonably helpful*.

Table 2. Descriptive statistics for each question on AD

	AD (<i>n</i> = 49)		Blindfolded (<i>n</i> = 36)		<i>t</i> (83)	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
How much have you managed to follow the AD?	3.35	.73	3.83	.37	3.06	.003
Do you like the voice of the audio describer?	3.02	.85	3.33	.86	1.66	.10
Do you find the voice of the describer adequate?	3.31	.71	3.80	.44	3.04	.003
Do you find the style of the AD adequate?	3.20	1.04	3.42	.90	1	.32
How formal was the AD?	3.71	1.27	4.08	1.18	1.38	.17
How fast was the AD?	3.77	.84	3.78	1.03	.01	.99
How smooth was the AD?	2.94	1.13	2.80	.96	.57	.57
How objective was the AD?	3.08	1.33	3.37	1.28	.98	.33
How difficult was it to follow the AD?	2.28	1.02	2.64	1.39	1.28	.20
How helpful was it to follow the AD?	3.88	.94	3.03	1.23	3.46	< .001

Note. Scores show the average evaluation reported on a 5-point Likert scale for the first four items (where 0 = very little and 5 = a great deal) and on a 7-point Likert scale for the remaining items.

5. General discussion and conclusions

Our study was carried out with the primary aim of assessing the cognitive and evaluative effects of AD on sighted viewers in order to determine empirically 1) whether AD interferes with sighted viewers' comprehension, memory and enjoyment of the film; 2) whether the attitude of sighted viewers towards AD is positive or negative; 3) whether AD without images (e.g., audio films) is totally disruptive for sighted viewers; 4) whether AD can really be used as an integration tool allowing VIPs and sighted users to mingle when 'watching' a film.

The results of our study show that AD does not seem to interfere much with viewers' comprehension, memory and appreciation of the film. When AD is added to the film, enriching what already is a complex semiotic system, the cognitive performance of sighted viewers does not deteriorate – although it does not improve markedly either. This is demonstrated by the satisfactory performance of sighted viewers in all cognitive measures (Table 1), their overall positive response to the evaluative measures (Table 1), and their favourable attitude towards AD in spite

of their lack of familiarity with this translation method (Table 2). In fact, the cognitive and the evaluative performance of sighted viewers is hindered only when they deal with a film delivered monosemiotically – that is, when sighted viewers are blindfolded and they listen to the AD without images. In this condition, the comprehension of the film decreases and also the response to evaluative measures is less positive, with film appreciation being (predictably) affected negatively, even if only slightly.

The fact that listening to AD without images leads to a poorer cognitive performance and to a lessened appreciation of the film might be due to two factors: first, the predominantly multimodal literacy of younger viewers, and second, the possible discomfort of wearing blindfolds.⁷ In fact, it is known that the younger generation are very amenable to combining and integrating multiple modes of communication: they do it increasingly spontaneously (New Media Consortium 2005, 3; Thomas 2007, 184), and they might find it difficult, confusing and not very effective – let alone enjoyable – to do otherwise. Blindfolded viewers instead struggled to gain a full understanding of the film as a whole – they reported that they had followed the AD *a great deal*, but they perceived it as only *reasonably helpful*. In fact, blindfolded viewers managed to code and remember well unrelated and disconnected details of the film. Although this seems to challenge some of the cognitive literature (e.g., Reyna and Brainerd 1995; Brainerd and Reyna 2002), we believe it indicates that the unfamiliar activity of listening to AD without images, even more so in an unnatural experimental setting, involves a certain effort for blindfolded viewers and this prevents them from integrating different multimodal stimuli into a coherent meaningful experience.

Although our results and empirical research confirm that sighted viewers report the greatest engagement levels when they watch a film *without* AD (a finding also shared by Fryer and Freeman 2012, 18), contrary to expectations, they show that the addition of AD does not dramatically affect the overall satisfaction of the film experience and the effort required to follow it. In fact, the addition of AD seems to help sighted viewers perform some cognitive tasks. For instance, the AD group performed better (even if not *much* better) in the recognition of visual details expressed verbally than the other groups, and they performed as well as the standard group in the image recognition task. The better performance of the AD group in the recognition of visual details expressed verbally seems to reconfirm the

7. Although we think that depriving participants of the sense of sight might have had a slight effect on their performance, no participant reported explicitly their discomfort in wearing blindfolds. Sensory deprivation is the deliberate removal of stimuli from one or more of the senses, and blindfolds are one of the simplest devices to cut off sight. Sensory deprivation is a standard methodological tool that has been used widely in psychological experiments (Zubek 1969).

ease displayed by younger sighted viewers in dealing with an added stimulus, and it seems to offer further empirical support to the beneficial role of double-stimuli in a multimodal viewing situation (Guichon and McLornan 2008; Grimes 1991; Paivio 1986). The good performance of the AD group in the image recognition task seems to suggest that there is no trade-off between audio and visual stimuli and that the visuals are remembered well also when supplementary auditory verbal information is added.⁸ This confirms previous findings in subtitling research demonstrating that, contrary to old beliefs (Koolstra et al. 2002), when the audiovisual message is moderately complex, processing a film with an added stimulus is not disruptive to the following and retention of visual details (Perego et al. 2010, 2015).

As mentioned earlier regarding specifically gist comprehension, the AD group did not score much better than the blindfolded group and scored the same as the standard group. This, we believe, indicates that the moderate complexity of the film excerpt might have enabled young and educated viewers to compensate for the potential difficulty of listening to the AD while blindfolded, and to adapt effortlessly to multimodal integration when watching the film with AD. It is conceivable that different results would emerge with a different sample of participants (e.g., older and/or less educated adults), and/or with a more complex audio described video with respect to pace, amount or redundancy of information delivered verbally, narrative structure, and language. We hypothesize that, in a more challenging situation, the AD group could deal less well with the added stimulus and therefore perform less well than the standard group in gist comprehension. It is known in fact that the features of TV messages may have a strong impact on users and on their processing strategies applied to audiovisual information (Grimes 1991; Lang 1995; Lang et al. 2000, 2013).

Overall, our results reinforce the view that watching a film is a cognitively effective process that is not affected by the addition of extra semiotic stimuli, be they written texts on screen (i.e., subtitles, as in Lavour and Bairstow 2011; d'Ydewalle and De Bruyker 2007; Guichon and McLornan 2008; Perego et al. 2010, 2015; Wissmath et al. 2009) or oral texts inserted between dialogues, as in this case. This result finally brings us back to our initial hypotheses and it confirms that mixed viewing situations where VIPs and sighted users enjoy the same film with AD are feasible. Nevertheless, as expected, the negative consequences of listening to AD without visuals suggests that films with AD (vs. audio films, cf. note 4; Busarello 2013) are more suitable candidates to use as an integration tool allowing VIPs and sighted users to mingle when 'watching' a film.

8. According to the literature, memory for images presented in different audiovisual contexts appears to be good: approx. 90% in Perego et al. (2010) and 78% in Perego et al. (2015), who tested subtitling and dubbing; nearly 100% in Szarkowska et al. (2013), who tested AD.

Our study also had the secondary aim of assessing whether sighted viewers could reap some benefits from AD and, accordingly, of determining whether AD could be exploited in extended settings. The cognitive effectiveness of AD and the lexical advantages (i.e., better recall of words delivered via the combination of nonverbal visual input and verbal aural input) that it seems to offer sighted viewers imply that AD could be exploited successfully in various settings and with a varied range of target users, thus expanding and refining its original audience and communicative purposes. Therefore, as suggested in the literature (e.g., Piety 2003; Remael et al. 2015), AD could be used to support vulnerable sighted viewers, such as elderly people with diminishing cognitive capacities, those unable to cope with the rapidity of moving images, or immigrants (Ofcom 2010; Remael and Vercauteren 2011); in general, it seems a powerful tool that can be duly exploited in aiding literacy development, language acquisition and language learning. Indeed, other forms of AVT have already been exploited to accelerate the acquisition of knowledge (and, specifically, of language) based on the positive effects of the dual coding theory (Paivio 1986; Guichon and McLornan 2008).⁹ How to best exploit the potential benefits of AD with varied audiences, however, is a phenomenon that needs to be further researched empirically through focused reception studies, even if the existing literature is promising (e.g., Fryer and Freeman 2012, 2013, 2014; Krejtz I. et al. 2012; Krejtz K. et al. 2012; Szarkowska 2013).

To conclude, in spite of some limitations (e.g., the use of a single, moderately complex AV stimulus; the absence of a control group made up of VIPs; the absence of more complex reception measures such as eye tracking and electroencephalography),¹⁰ our study confirms the effectiveness and the potential of empirical research in AVT. It should therefore encourage researchers to explore

9. Paivio's dual coding theory – a theory on cognition – suggests that humans process information through dual channels, one auditory and the other visual. This theory was proposed to explain multimodal learning and it has important implications for instruction. According to Paivio (1986), during learning, an individual takes verbal (words) and non verbal (images) sensory input and processes them in different but connected channels, and the human mind creates separate representations for information processed in each channel. In spite of the limitations of each channel (e.g., humans have difficulty simultaneously attending to multiple auditory or visual cues, depending on expertise with the task or prior knowledge with the subject area), multi-modal sensory information can improve the ability to recall the details of an experience. In fact, if information is coded in both systems (as, for instance, with subtitles and verbal language), the learner retains and recalls it more easily, because associations will be formed between the two systems.

10. Electroencephalography is the recording of electrical activity along the scalp as used extensively in neuroscience, cognitive science, cognitive psychology, neurolinguistics and psychophysiological research.

further aspects of AD processing as well as other potential users of AD, expanding the current methodological horizons, combining new approaches, drawing from different disciplines, and considering the challenges, the merits and the practicalities of managing an ever larger box of methodological tools.

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