

The psychophysiological impact of audio described porn¹

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Abstract

Research on audio description (AD) has undergone an enormous development in the last decade. Unfortunately, little attention has been devoted to the social, psychological and emotional factors influencing AD, one exception being the recent line of research which empirically explores the emotional reception of AD (Ramos & Rojo, 2014; Ramos, 2015, 2016) and the influence of psychological factors in its production phase (Ramos & Rojo, 2020). Results from these studies satisfactorily prove that audio described films are capable of evoking a similar emotional response to that elicited by their audiovisual counterparts, especially for scenes inducing disgust and fear, and that reception and production depend largely on film typology. The purpose of this new study is to analyse whether the audio described version of porn scenes can also offer its audience a similar experience to that provided by the original audiovisual scenes. Forty-seven sighted and visually impaired women (mean age = 25.12) took part in the experiment. The sample was divided into two groups: 25 sighted women watched the original audiovisual version of the clips, whereas 22 visually impaired women listened to the audio described version. Participants' emotional response was analysed by a combination of an indicator of autonomic activation (heart rate, HR,) and self-report measures. Our results indicate that audio described porn films are capable of eliciting a similar response in both blind and sighted audiences to the one evoked by original audiovisual scenes.

Keywords: emotional response; arousal; audio description; reception; psychophysiology.

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1. Introduction

Just in Europe there are estimated to be over 30 million blind and partially sighted citizens who do not have access to the majority of audiovisual content, despite the effort made to grant universal access to communication all over Europe (e.g., European Accessibility Act, 2018). Audio description (hereinafter, AD) is a modality of audiovisual translation which translates the images of audiovisual texts (e.g., films, theatre, documentaries) into words in order to make them accessible to a blind audience. Within Translation Studies, research on AD has undergone an enormous development in the last decade, focusing mainly on the creation and analysis of guidelines (Rai et al., 2010) and the description of existing scripts (Jiménez, 2010). But experimental research on the processes involved in the creation and reception of AD is still scarce and has addressed almost exclusively the information selection stage, either through the analysis of the verbal descriptions made by sighted participants (Mazur & Kruger, 2012) or through the use of eye-trackers to identify where sighted viewers focus their visual attention (Orero & Vilaró, 2012).

Unfortunately, less attention has been devoted to the social, psychological and emotional factors influencing AD, one exception being the recent line of research that empirically explores the emotional reception of AD (Ramos & Rojo, 2014; Ramos, 2015, 2016) and the influence of psychological factors—e.g., creativity—in its production phase (Ramos & Rojo, 2020). Results from these studies satisfactorily prove that audio described films are capable of evoking a similar emotional response to that elicited by their audiovisual counterparts, especially for scenes inducing disgust and fear. But it is still necessary to deepen our understanding of the emotional and cognitive processes involved in the reception of different types of audio described texts. With that aim, the present study continues the work previously conducted on negative emotions (Ramos, 2015, 2016) and focuses on the AD of porn movies. Our aim is to explore whether the audio described version of scenes with explicit sexual content is capable of offering a similar experience to that provided by their audiovisual counterpart.

The industry around adult films is a global business receiving almost 100 billion dollars a year. According to the 2018 annual report by the Internet site Pornhub (2019), this site alone receives 33.5 million yearly average visits and 92 million daily ones (average age = 35.5; 29% of women and 71% male). And as Snyder (2016), director of the audio description project at the American Council of the Blind puts it, “people who are blind have every right to access porn as they do classical Shakespeare or any other kind of video”. There are also good economic reasons for developing porn for the blind, since “[t]he [blind] community is large and has buying power” (Snyder, 2016). In the United States, some projects have been developed to make porn accessible for the blind. In 2006, the website Pornfortheblind.org was conceived as a library of MP3 files with descriptions of popular adult videos recorded by volunteers. The site managed to attract 150,000 visitors per month. Although this platform no longer exists, it highlighted the immense relevance and impact of the initiative. More recently, in 2016, the giant Pornhub

presented the initiative *Described Videos*, which presents a selection of their top performing films with added audio description for their visually impaired users.

This paper explores the response elicited by audio described porn movies. But before introducing the study, previous work on the emotional reception of AD is reviewed with a particular focus on the measurement of emotions, the relevance of the audience and the relationship between emotional response and sexual activation.

2. The emotional reception of audio description

2.1. The psychophysiological measurement of emotions elicited by AD

In an attempt to boost the analysis of the cognitive and emotional processes involved in the reception of AD, research on AD has experienced an unprecedented upsurge in recent years with the inclusion of experimental methodologies. Some of these studies focus specifically on emotions and their link to other phenomena highly related to fictional emotions, such as immersion (Walczak, 2017; Wilken & Kruger, 2016) and presence (Fryer & Freeman, 2013, 2014; Walczak & Fryer, 2018).

Most of the studies mentioned above rely solely on participants' subjective responses to questionnaires, and only a handful combine subjective and psychophysiological measurement (Fryer, 2013; Iturregui-Gallardo, 2019; Ramos, 2015, 2016). In order to test whether the semantic information provided by AD reduces the emotional engagement offered by music and sound effects, Fryer (2013) used a combination of psychophysiological measures (i.e., electrodermal activity (EDA), heart rate (HR) and heart rate variability (HRV)) and self-report questionnaires. With the help of the questionnaire Sense of Presence Inventory (Independent Television Commission (Lessiter et al., 2001)), and also on social presence (affect and empathy), the study measured four dimensions of emotional presence to analyse user experience in AD. The author applied the methodology used in Fryer & Freeman (2014), in which 19 participants with visual impairment listened to 3 film clips eliciting fear and 3 eliciting sadness. A professional audio describer wrote the AD, and two versions of it were recorded: one using TTS technology (text-to-speech) and the other with a human voice. Results differed between emotion categories (sadness/fear) but showed that AD did not lead to a reduction in presence or in levels of elicited emotion, despite AD partially masking the soundtrack. Of all physiological measures, heart rate variability (HRV) was the only measure to show a significant response.

Another such example of the use of psychophysiological measures in the study of emotional reception is the research conducted by Iturregui-Gallardo (2019) for his PhD thesis. The author analysed the emotional reception of audio subtitles (AST), i.e., subtitles read aloud for those who cannot see them, a modality highly related to AD. According to the author himself, audio subtitles are the perfect intersection between subtitles, AD and voice-over. The paper describes

a study to analyse the emotional reception of two AST strategies: dubbing effect and voice-over effect. The audience's emotional response was measured by a combination of psychophysiological measurements (electrodermal activity and HR) and self-report instruments. His results from self-report data show that AST with dubbing effect are more emotionally activating than with voice-over effect, but only for the emotion of fear. Self-report questionnaires also showed that emotional activation was similar in blind, partially sighted and sighted audiences when exposed to the same stimuli. However, psychophysiological measures did not confirm these results.

Two studies conducted by Ramos (2015, 2016) are, to our knowledge, the only studies that employ self-report and heart rate measures to compare the responses of visually-impaired and sighted participants to AD scenes eliciting basic emotions. These studies compare the emotional power of audiovisual texts with and without AD for the emotions of fear, sadness and disgust, and assess the efficacy of different AD styles: a more descriptive and neutral AD versus a more subjective and narrative AD. Results suggest that AD is capable of eliciting an emotional reaction as strong as the one evoked by the original scenes, especially for the emotions of fear and sadness. Data from these studies also reveal that although different types of scenes might require different strategies, subjectivity is widely accepted both by sighted and visually impaired audiences.

As we have seen, previous results mainly point to the fact that AD is capable of eliciting emotional reactions that are mostly as strong as those elicited by original audiovisual scenes, but data depends largely on film typology (cf. Walczak, 2017; Fryer & Freeman, 2013, 2014; Fryer, 2013; Walczak & Fryer, 2018; Iturregui-Gallardo, 2019). The present paper explores the experiences evoked by different modalities in blind and sighted audiences (audiovisual vs. audio described content) by focusing on films with explicit sexual content. Research on different modalities (i.e., watching vs. hearing) and on the reception by different audiences (i.e., sighted vs. visually impaired) is first reviewed.

2.2. Different modalities, different audiences

There is evidence that points to the fact that blind and sighted participants should feel similarly when presented with the same version of a stimulus. Audiovisual and AD experiences were first assessed by Peli, Fine & Labianca (1996) in a study which compared the levels of comprehension of AD information between totally blind, partially blind and sighted participants. The authors concluded that although AD is generally a useful technique, it may also be redundant when visual information can be inferred by dialogues and other sound information. Later on, Chao Ya-Li compared audiovisual experience with that offered by AD and observed a huge experiential gap between both modalities in the meaning construction process during research conducted in Taiwan between 1988 and 1989 (explained in Yeung (2007)). These studies rendered interesting results but relied solely on questionnaires and surveys, reflecting only participants' subjective opinions.

Apart from the response elicited by different modalities (audiovisual vs. audio-described films), in the present study we also compare the emotional impact on sighted and visually impaired participants when confronted with the same stimulus. A relevant concept for this comparison is emotional contagion, which is one of the central processes involved in the emotional response to media (Goldman, 2006; Plantinga, 1999; Smith, 2006). Emotional contagion describes instances when we automatically, i.e., without cognitive mediation, feel the same as another person. It has frequently been associated to emotional responses to films due to its relationship with mirror neurons and vision. There is now evidence (e.g., Hauk & Pulvermüller, 2004; Speer et al., 2005) suggesting that mirror neurons can also be activated through sound stimuli. Listening to the description of actions can activate the brain circuits responsible for planning and execution of those same actions. Some results even show that visually impaired and sighted audiences display similar patterns of mirror neuron activation when hearing sounds (Ricciardi et al., 2009). The visual cortex and the amygdala of sighted and visually impaired participants react similarly when processing verbal and emotional stimuli (Bedny et al., 2011, 2012; Klinge et al., 2010).

2.3. Emotional response and sexual activation

Emotions are a multi-componential phenomenon that escapes an easy definition. In fact, the study and measurement of emotion is rather recent and controversial, for it has long been considered an immeasurable construct (Panksepp, 2008). Even today there are conflicted views among researchers in relation to many characteristics of this phenomenon, such as the inclusion or exclusion of cognition in the emotional process (e.g. Moors & Scherer, 2013; Robinson, 2005; Scherer et al., 2001). Scherer (2005) manages to provide a comprehensive consensus definition, describing emotions in terms of the five components co-occurring in an emotional episode. According to Scherer (2005), emotions are “an episode of interrelated synchronized changes in the states of all or most of the five organismic subsystems in response to the evaluation of an external or internal stimulus event as relevant to major concerns of the organism” (Scherer, 2005: 697). These five subsystems are, namely, the cognitive, neuro-physiological, motivational, motor expression and subjective feeling components.

When an emotional episode takes place, all or some of these subsystems react conjointly and leave measurable evidence of that emotional reaction in the body. For instance, the motor expression subsystem can be measured by observing changes in bodily and facial movements. However, the most commonly measured subsystem is the subjective feeling component: with the help of questionnaires and interviews, the researcher investigates what subjects feel (Rottenberg et al., 2007). But retrospective data obtained by questionnaires and interviews presents the drawback of not being completely objective, hence other more objective measurements have recently begun to be included in order to obtain a more realistic picture of the emotional episode. Such is the case of the analysis of the physiological component, which has typically involved the measurement of galvanic skin response (Wiens et al., 2003),

heart rate and heart rate variability (Appelhans & Luecken, 2006), and cortisol levels in blood and saliva (Sudheimer, 2009).

Although sexual arousal cannot be considered as an emotion itself, the connection between emotional and sexual reactions has been widely researched. Sexual arousal can be defined as

the combination of cognitive and physical responses to an erotic stimulus, which in turn can be internal or external. One can feel aroused by appraising a picture, touching and being touched, or by one's own thoughts or fantasies. Arousal includes physiological activation such as increased blood flow in the genitals, nipple erection, vaginal lubrication, swelling of the testes, and pupil dilation. It also includes a subjective appraisal of feeling sexually aroused (Castro, 2014: §3).

This definition points to a high similarity between sexual arousal and emotional responses: both are basic evolutionary mechanisms that imply the simultaneous activation of several cognitive and physiological reactions in response to an external or internal stimulus. Furthermore, sexual activity involves typical features of emotions, specifically excitement with high arousal and pleasure (i.e., positive valence; Walter et al., 2008).

And yet these coincident definitions are not the only connection between sexual and emotional activation. Sexual arousal is influenced by emotions and, in turn, emotions are influenced by sexual arousal. Several studies prove the immense influence that emotions have on sexual arousal (Nobre & Pinto-Gouveia, 2007; Koukounas & McCabe, 2001). Emotional reactions can even predict sexual arousal, especially in the case of positive and ambivalent affective states (i.e., co-occurring positive and negative states, Peterson & Janssen, 2007). And the opposite reaction also takes place: there is evidence that sexual arousal is capable of influencing or even inhibiting certain emotional reactions such as disgust (Borg & de Jong, 2012). This close interrelation between emotional and sexual responses also has a physiological correlation: it has been proven that brain activations specifically related to erotic feelings and those related to general emotional processing are hard to disentangle, even when certain neural differentiation between them may be established (Walter et al., 2008).

3. Studying the emotional response to adult films with and without AD

3.1. Aim and hypothesis

The aim of the present study is to compare the emotional impact of porn scenes in two versions: a) a version as full audiovisual stimuli (sound and image, AV) and b) an audio version including the audio description of the scenes (AD, original soundtrack). With this aim in mind, the following hypotheses are posed:

1. The subjective emotional impact of films will be independent of disability: when exposed to porn stimuli, both sighted (S) and visually impaired participants (VI) will re-

port more positive emotional states (lower state anxiety, higher positive affect and lower negative affect) and higher levels of sexual arousal.

2. The audio described film (only audio) will elicit a cardiac response similar to that of the film as whole audiovisual text. Exposure to the film will elicit a higher heart rate compared to the baseline and recovery phases.

3.2. Participants

Forty-seven Spanish participants took part in the experiment. All sighted participants were recruited from the University of Murcia, whereas all blind participants were contacted through the National Organisation for the Blind (ONCE) at its headquarters in the city of Murcia. The ONCE gave permission to conduct the experiment and searched for volunteers among their visually impaired members. All participants granted their consent to participate according to the protocols of the University of Murcia Ethics Committee, and the study was conducted in accordance with the Declaration of Helsinki.

The sample was composed only by women aged 18 to 40 years old, the mean age of participants being 25.12. This specific age range was chosen according to the fact that young audiences are usually more familiar with audiovisual products of the type used in the present experiment. All blind participants met the criteria to be considered visually impaired by the ONCE²; 3 of them were totally blind, and the rest were partially blind. Out of 47 participants, 72.85% consider themselves heterosexual, 7.14% homosexual, 17.4% bisexual, 1.43% asexual and 1.43% pansexual. And yet sexual orientation seems to have a low impact on women's sexual responses. Contrary to what happens with men, women show little category specificity on either genital or subjective measures: when confronted with films depicting sexual intercourse, both heterosexual and homosexual women seem to experience strong genital and subjective arousal to scenes including both male and female actors (Chivers et al., 2004).

Before performing the experiment, all subjects filled in a questionnaire about their socio-economic background and spectatorial preferences. We included questions concerning health factors that could influence participants' emotional response and therefore had to be controlled, such as day on the menstrual cycle (Chen et al., 2011) and smoking behaviour (Keely & Driscoll, 2013; Nesbitt, 1973). Of the total sample, only 3 women smoked and all three smoked less than 10 cigarettes a week, so this variable was not taken into account in the statistical analyses.

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- 2 The criteria for inclusion in the ONCE is having, at least, one of the following visual conditions in both eyes, and a reliable prognosis of no visual improvement:
 - o Visual acuity equal to or less than 0.1 obtained with the best possible optical correction.
 - o Visual field reduced to 10 degrees or less.

The two independent study groups were:

- AV: 25 students from the University of Murcia (mean age: 20.88; SD: 0.86) watched and heard the scenes with sexual content in their audiovisual version. All participants in this group were in the process of acquiring a university degree, whereas 34.61% of them already had a previous college degree. Most participants (80.77%) belonged to an average socioeconomic environment. Only three of them (11.54%) had a low socioeconomic level and one of them came from a high socioeconomic environment (3.85%). Most participants (65.38%) considered themselves heterosexual, 26.92% bisexual and 7.96% homosexual. All participants reported a high exposure to media, especially films and series: 31.8% of them watched movies and series every day, 61.53% once a week and 11.54% once a month. Most of them usually watched media on their laptop (76.92%) and only 6 on TV (23.07%).
- ONCE: 22 visually-impaired participants (mean age: 29.95; SD: 8.1) listened to the scenes with sexual content (only audio version: original audio + AD, black screen). Their level of studies was more heterogeneous: 31.4% had a basic education degree, 18.2% had a high school diploma, 4.5% had a professional training degree and almost half of them (45.5%) had a college degree. Most participants (86.36%) belonged to an average socioeconomic environment. Only five of them (22.7%) had a low socioeconomic level. Most participants (86.4%) considered themselves heterosexual, one bisexual (4.5%), one homosexual (4.54%) and one asexual (4.54%). Most participants reported a high exposure to films and series: 72.7% usually watched movies and series without AD, 18.1% usually watched movies and series with AD and 2 participants did not usually watch movies or series (9.1%). 22.72% of them watched movies and series every day, 50% once a week, 18.2% once a month and 4.5% every 2-3 months. Half of them usually watched media on TV (50%), 40.90% on their laptop and only 2 on their cell phone (9.1%).

In general, both groups were balanced, although slight differences were detected. Visually impaired participants were older (AV: 20.88; ONCE: 29.95) and had in general a more heterogeneous academic background and reported a lower exposure to films than sighted participants. All visually impaired participants had previous experience with AD.

3.3. Materials and stimuli

We selected two porn scenes previously validated as stimuli for sexual activation in heterosexual women, obtaining comparable validation results in terms of sexual arousal (Gómez-Lugo et al., 2016). Each scene lasted 6 minutes and both had a similar content: they depicted a heterosexual encounter between a woman and a man and included similar sexual practices (foreplay, cunnilingus, fellatio and intercourse). Both sexual encounters were initiated by the woman and focused mainly on her pleasure. Before the explicit content, there was a context of emotional development between the actors, and actors' expressions and appearance were

natural (cf. Gómez-Lugo et al., 2016). Clips were treated as one 12-minute video in order to give enough time for participants' psychophysiological reactions to unveil. The two scenes were presented in randomized order: half of participants in each group watched or heard scene 1 first and then scene 2, whereas the other half watched or heard scene 2 first and then scene 1.

A team of professional audio describers created and recorded the audio description of the scenes. Although previous studies had suggested that intonation plays an important role in the reception of AD (Iglesias, Martínez & Chica, 2011), we decided to record the AD with a neutral intonation, following the actual trend in Spanish AD of using a neutral voice (AENOR, 2005). Two different versions of the stimuli were designed:

- I. Original scenes in their audiovisual mode.
- II. Audio described scenes without images (original audio only + AD, black screen).

3.4. Instruments

Several instruments were used to measure participants' emotional response. In order to measure participants' emotional states and traits, we selected three validated self-report questionnaires frequently used to measure the subjective feeling component of emotion and sexual reactivity: the Positive and Negative Affect Schedule (PANAS, Watson et al., 1988), the State-Trait Anxiety Inventory (STAI, Spielberger et al., 1970) and the Sexual Inhibition / Sexual Excitation Scale (SIS/SES, Moyano & Sierra, 2014).

The Positive and Negative Affect Schedule was evaluated by the Spanish version (Sandín et al., 1999) of the PANAS (Positive and Negative Affect Schedule; Watson et al., 1988). It requires participants to rate the intensity of their emotions on a 5-point Likert scale. In its extended version, the authors included several items describing certain emotional states, such as *active*, *alert*, *inspired*, *ashamed*, *fearful*, *sad* or *nervous*. The questionnaire is easily administered, and has been widely used to measure participants' emotional reaction, including to film scenes (Rottenberg et al., 2007).

The State-Trait Anxiety Inventory (STAI, Spielberger et al., 1970) measures two types of anxiety: state anxiety (i.e., anxiety about an event) and trait anxiety (i.e., the level of anxiety as a personal characteristic). It consists of 40 items and asks participants about their subjective feelings on a 4-point Likert scale.

Last, the Sexual Inhibition / Sexual Excitation Scale (SIS/SES, in its short form) was validated in Spanish by Moyano & Sierra (2014), but first developed in English by Carpenter et al. (2010). It consists of 14 items evaluated on a 4-point Likert scale. The 14 items can be grouped in 3 subscales corresponding with different dimensions of sexual reactivity:

- o SES (arousal): sexual arousal derived from social interactions (items 1, 3, 8, 10, 11, 14).

- o SIS1 (inhibition 1): the fear to lose sexual arousal due to a distraction or not being fully focused on sexual sensations (items 4, 9, 12, 13).
- o SIS2 (inhibition 2): the threat to lose sexual arousal if there is a risk of being surprised during sexual interaction or acquiring a sexually transmitted disease (items 2, 5, 6, 7).

The RSA (Ratings of Sexual Arousal, Mosher, 2011; in Spanish, *Valoración de Excitación Sexual, VES*; validated by Sierra et al., 2017) uses a 7-point Likert scale composed of five items: overall estimation of sexual arousal, estimation of the intensity of genital sensations, the sensation experienced, non-genital physical sensations and the level of self-absorption experienced in the sexual situation. A higher score indicates a higher level of sexual arousal.

Additionally, the physiological component of emotions was assessed. This component can be traced by various bodily symptoms, such as galvanic skin response (Wiens et al., 2003), hormonal secretion (Sudheimer, 2009), or heart rate (HR) and heart rate variability (Newell, 2005). For the present study a HR monitor (POLAR VANTAGE M M/L) was used, which consisted of a chest belt for heart beat detection and transmission, and a “watch” for data collection and storage. HR measurement was deemed as a highly useful technique for being easily transportable and administrable, as well as relatively inexpensive. Moreover, heart monitors have already been validated as an effective method to measure HR in situations of physical and mental stress (Goodie et al., 2000). In this study, the heart monitor was used together with a H7 chest strap. Kubios HRV premium (version 3.2) was used to download and analyse HR data. HR were continuously measured during the entire experimental session as an index of physiological activity. Following the recommendation of the Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology (1996) only the central five minutes of each period (baseline, task and recovery) were analysed.

3.5. Procedure

The experiment took place in the headquarters of the Spanish National Organisation for the Blind (ONCE) in Murcia and in the Faculty of Arts and Humanities at the University of Murcia (Spain). A quiet room isolated from external noise with a table and two comfortable chairs was used in both experimental settings. The films were played in a 13” MacBook Pro and through Sennheiser HD 219-S high-end headphones. The participants adjusted the volume of the headphones before the experiment would start. Each participant was received individually and informed of the need to wear a strap with a Heart Rate Sensor attached to their chest in order to record information about their heart rate when taking part in the experiment. They were also told that they would hear or watch some porn clips and answer a series of questions, but the specific purpose of the study remained unknown to them.

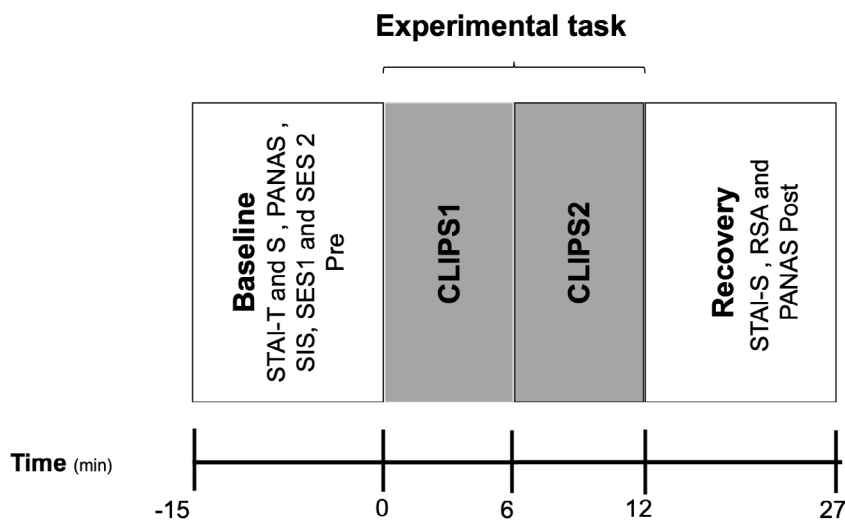
The protocol started with a baseline phase of 15 min to allow the participants to adapt to the experimental setting. During this phase, the participants remained seated, and baseline mea-

asures were obtained for HR. The questionnaires for state-trait anxiety (STAI), positive and negative mood (PANAS) and the Sexual Inhibition / Sexual Excitation Scale (SIS/SES) were completed by the sighted. In the case of the blind, these questionnaires were read aloud and filled-in by one of the experimenters. After these initial measurements, the experimental task would begin. The participants were left alone while they watched or heard the clips (experimental task).

After film exposure, the post-stimulus questionnaires were filled in to measure participants' emotional response and sexual arousal. Average time of completion of the whole experiment was between 42 and 47 minutes. The data gathering protocol is schematically presented in Figure 1.

FIGURE 1

Schematic of the different phases of the experimental protocol



3.6. Statistical analyses

Heart rate (HR) was tested for normal distribution and homogeneity of variance using the Kolmogorov-Smirnov and Shapiro-Wilk tests before the statistical procedures were applied. These analyses did not reveal significant deviations from normality. One-way ANOVAs were then conducted in order to test group differences (AV vs. ONCE) on age, body mass index (BMI), trait anxiety, sexual inhibition / sexual excitation scale and ratings of sexual arousal.

To assess group differences in state anxiety and negative and positive affect before and after the task, as well as in the cardiac response during the different phases of the protocol, we conducted separate repeated measures analyses of variance (ANOVAs) with group as a between-subjects factor (AV vs. ONCE) and time as a within-subjects factor (three phases for heart rate: baseline, task and recovery phases; and two phases: pre- and post-task, for anxiety

and for positive and negative affect). Also, variation indices (delta) of cardiac activity were computed for task and recovery phase by subtracting the baseline value. A repeated measures analysis of variance (ANOVA) was conducted using group (AV vs. ONCE) as a between-subjects factor and delta (delta task, delta recovery) as a within-subjects factor.

Since significant differences in age, BMI and trait anxiety levels were found between the groups (cf. 3.7.1), these variables were introduced in the analyses as covariates for all measures, and post-hoc contrast analyses were conducted. All results were corrected using the Greenhouse-Geisser procedure, where appropriate. Post-hoc comparisons were performed using Bonferroni adjustments for multiple comparisons. As a measurement of the effect size, we report Partial Eta Squared (η^2_p) values. All statistical analyses were performed on SPSS 26.0.

3.7. Results

3.7.1. Anthropometric and demographic variables

Significant differences were found between the groups on age, BMI and trait anxiety. The ONCE group was significantly older, showed higher BMI and lower trait anxiety than the other group. However, both groups showed similar scores in the 3 subscales corresponding with different dimensions of sexual reactivity. The main characteristics of the groups are shown in Table 1.

TABLE 1

Descriptive statistics for anthropometric and demographic variables

| VARIABLES | GROUP | N | MINIMUM | MAXIMUM | MEAN | S.E.M | F | P-VALUE |
|------------|-------|----|---------|---------|-------|-------|-------|-----------------|
| Age | AV | 25 | 20 | 23 | 20.88 | 0.13 | 31.38 | <.001 |
| | ONCE | 22 | 18 | 40 | 29.95 | 1.72 | | |
| BMI | AV | 25 | 17.58 | 30.80 | 21.75 | 0.66 | 4.40 | .042 |
| | ONCE | 22 | 16.87 | 19.52 | 23.66 | 0.60 | | |
| STAI Trait | AV | 25 | 9 | 47 | 30.28 | 2.20 | 5.20 | .027 |
| | ONCE | 22 | 11 | 39 | 24.09 | 1.44 | | |
| SIS | AV | 25 | 8 | 22 | 14.88 | 0.58 | 0.33 | .565 |
| | ONCE | 22 | 11 | 20 | 14.40 | 0.55 | | |
| SES1 | AV | 25 | 9 | 20 | 14.40 | 0.58 | 0.005 | .947 |
| | ONCE | 22 | 7 | 21 | 14.50 | 0.68 | | |
| SES2 | AV | 25 | 9 | 16 | 13.00 | 0.38 | 0.13 | .718 |
| | ONCE | 22 | 8 | 16 | 12.77 | 0.50 | | |

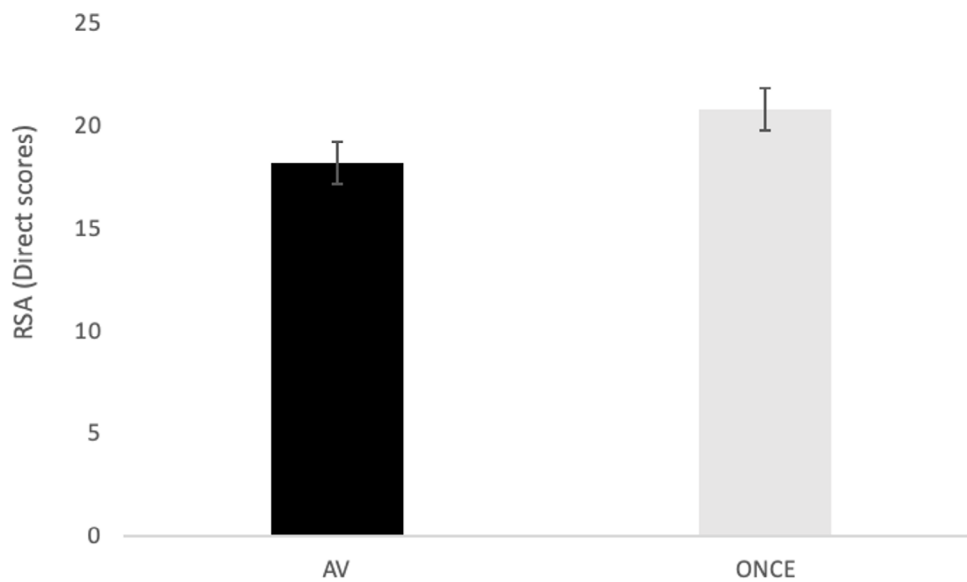
Note. BMI: Body Mass Index.

3.7.2. Subjective and cardiovascular measures

For the RSA scale, no significant differences were found between the groups [$F(1, 42) = 1.36$; $p = 0.25$; $\eta^2_p = 0.03$], and participants reported to be moderately to highly sexually aroused by the films (AV mean: 18.04; ONCE mean: 20.90; max. punctuation, 35) (see Figure 2).

FIGURE 2

Means for the scale of Rating Sexual Arousal in both groups. Error bars represent standard error of the mean (SEM)

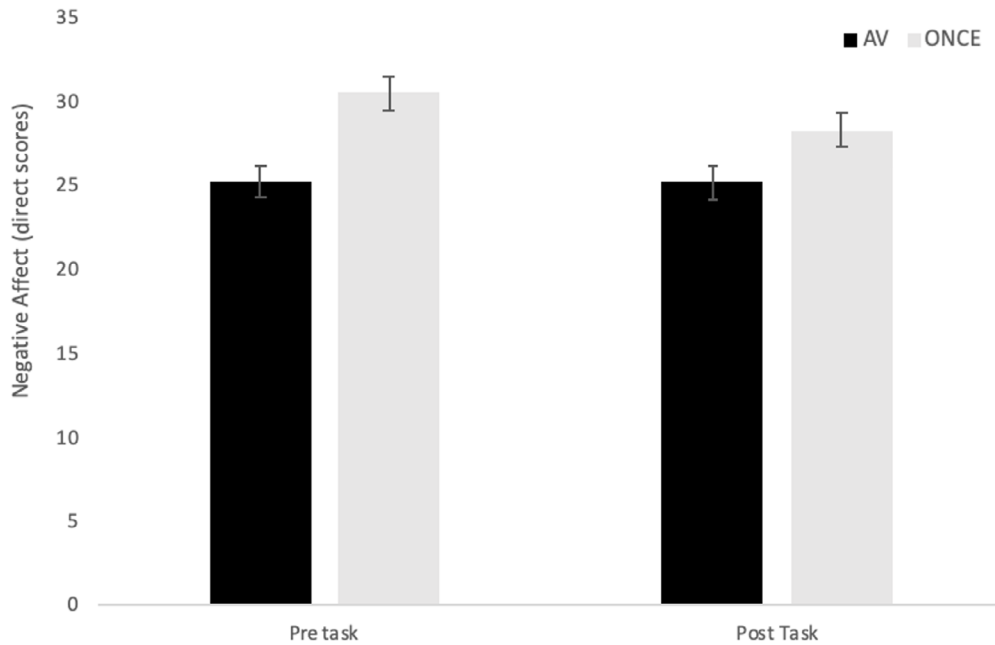


For state anxiety, no significant main effect of time [$F(1, 42) = 0.01$; $p = 0.91$; $\eta^2_p = 0.01$], group [$F(1, 42) = 0.50$; $p = 0.48$; $\eta^2_p = .01$] nor time * group interaction [$F(1, 42) = 0.94$; $p = 0.33$; $\eta^2_p = 0.02$] was found.

As regards the PANAS, results will be described in relation to the two different subscales: positive affect (PANAS-P) and negative affect (PANAS-N). For positive affect (PANAS-P), no significant main effect of time [$F(1, 42) = 0.47$; $p = 0.49$; $\eta^2_p = 0.01$], group [$F(1, 42) = 0.62$; $p = 0.43$; $\eta^2_p = 0.01$] nor time * group interaction [$F(1, 42) = 0.57$; $p = 0.45$; $\eta^2_p = 0.01$] was reported. For negative affect (PANAS-N), no significant main effect of time [$F(1, 42) = 1.28$; $p = 0.26$; $\eta^2_p = 0.03$] was found either, but results showed a significant main effect of group [$F(1, 42) = 5.07$; $p = 0.03$; $\eta^2_p = 0.10$] and time * group interaction [$F(1, 42) = 4.18$; $p = 0.04$; $\eta^2_p = 0.09$]. Post hoc analyses revealed that significant differences between groups appeared only pre-task, with the ONCE group showing the highest levels of negative affect (ONCE vs. AV $p = 0.008$). Only the ONCE group decreased the negative affect after the experimental task (pre- vs. post-task, $p = 0.02$). In the other group no significant differences between pre- and post-task affect (AV: pre- vs. post-task, $p = 0.91$) were reported (see Figure 3).

FIGURE 3

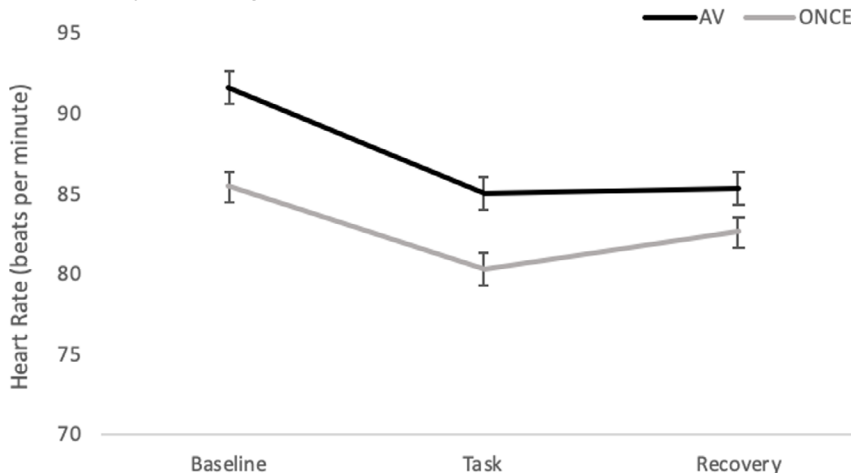
Estimated means for each moment (pre- and post-task) for negative affect in both groups. Error bars represent standard error of the mean (SEM)



Last, the psychophysiological component of emotion did not reveal statistical differences between the groups. For HR, no significant main effect of time [$F(2, 84) = 0.49$; $p = 0.61$; $\eta^2_p = 0.01$], group [$F(1, 42) = 0.77$; $p = 0.38$; $\eta^2_p = 0.01$] nor the time * group interaction [$F(2, 84) = 1.03$; $p = 0.36$; $\eta^2_p = 0.02$] was reported (see Figure 4).

FIGURE 4

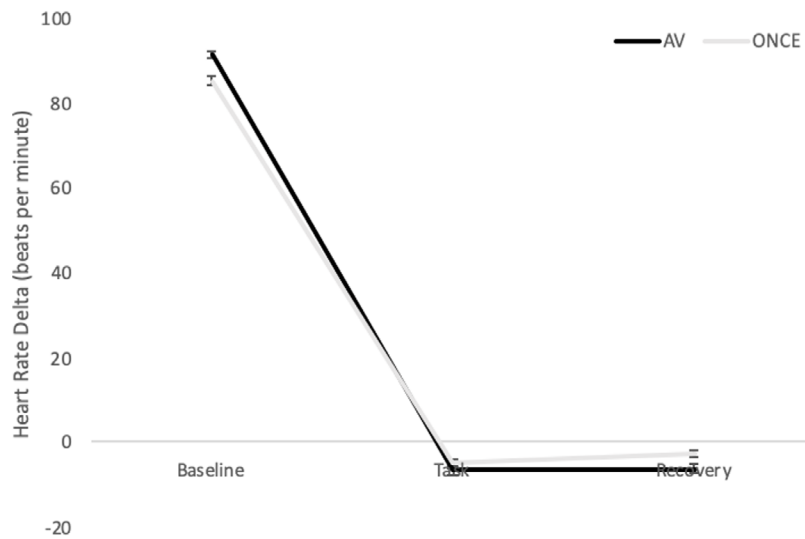
Estimated means for each moment of the experimental protocol in heart rate (baseline, experimental task and recovery) for both groups. Error bars represent standard error of the mean (SEM)



With regard to the delta values (i.e., variation indices) of HR, no significant main effect of delta factor [$F(1, 42) = 0.88$; $p = 0.35$; $\eta^2_p = 0.02$], group [$F(1, 42) = 1.59$; $p = 0.21$; $\eta^2_p = 0.03$] nor the delta * group interaction [$F(1, 42) = 0.59$; $p = 0.44$; $\eta^2_p = 0.01$] was reported either. In general, heart rate showed a decelerative pattern in both groups during the exposure to task (see Figure 5).

FIGURE 5

Cardiac variation (delta scores in task and recovery) during the protocol experimental in both groups. Error bars represent standard error of the mean (SEM)



3.8. Discussion and conclusions

Results from the study confirm our first hypothesis, since no significant differences were found between the groups. Overall, participants reported to be moderately to highly sexually aroused by the films, and their general affective state was not significantly modified by the experimental task. The fact that the experience of both groups was similar suggests that films with AD are capable of eliciting a subjective emotional response similar to that of films as a whole audiovisual text independent of disability. It also confirms results obtained in previous studies on the emotional response of AD that show an effect as strong as that provided by original audiovisual films (cf. Walczak, 2017; Fryer & Freeman, 2013, 2014; Fryer, 2013; Walczak & Fryer, 2018; Iturregui-Gallardo, 2019).

The slight differences on affect reported for the ONCE group could be pointing to a greater effect of the AD version, a result previously observed in the literature (e.g., Fryer & Freeman, 2013). However, this explanation is not supported by self-report data on sexual arousal or HR data, which showed no significant differences between the groups. A different explanation may be found in the attitudes of the ONCE group towards the experimental task. Participants in this group reported a higher negative affect in the pre-task questionnaire, which was later

neutralised in the post-task, when their levels of negative affect decreased after watching the films. A plausible explanation for this change is that visually impaired participants perceived the experiment as a negative situation: they were unfamiliar with the experimenters and probably feared the unknown. They knew the study involved envisioning films with explicit sexual content, something that might seem distressing beforehand. But once the session was settled and they had been exposed to the films, they were able to relax and feel comfortable. In contrast, all sighted participants were students familiar with the experimenters, which could explain why they did not perceive the experimental situation as negative and why their affective state was not modified along the session.

In contrast, results on HR only partially confirm our second hypothesis. As expected, cardiac response to the film was similar in both groups, but the experimental task did not elicit a higher cardiac response compared to the other phases of the session. Nonetheless, even if no significant differences were reported between experimental phases, the task generally decreased heart rate in both groups. One explanation may be the fact that the stimuli were not powerful enough, since according to the participants' subjective perception they were only moderately aroused. A higher arousal level may be necessary to produce a change in cardiac response. Another explanation may be that this decreased pattern can be interpreted as an orientation or attentional response caused by the novelty of the stimulus, as already indicated in classical studies (Bernston et al., 1994; Bradley et al., 1993; Martínez-Selva, 1995; Bradley et al., 2001). Image perception studies show a bradycardic pattern (decrease in heart rate) when people observe images of content that they consider interesting (typical of the orientation response), while they present an accelerative pattern when images are perceived as aversive (Bradley et al., 2001). However, this effect should be further analysed comparing our results with the response produced by interesting and aversive stimuli.

Results from the present paper are preliminary and further research on the analysis of the AD reception of films with explicit sexual content is needed. There are some obvious limitations that should be addressed in future studies, the main one being the use of HR as the only psychophysiological measure. As previously mentioned, the decrease in HR observed in both groups during film exposure could be related to the stimuli, but could also be due to an increase in participants' parasympathetic activity. HR measures represent the effect of the relative contributions of an excitatory system (the sympathetic nervous system or SNS) and an inhibitory system (the parasympathetic nervous system or PSNS). The inclusion of some additional sympathetic and parasympathetic indices related to cardiovascular activity would be necessary to better characterise the autonomic activity supporting cardiac response. Other measurements of emotional response which could be analysed are salivary cortisol, HRV, facial expressions and other cognitive variables related to emotion, such as transportation.

Another limitation is related to differences in group profiles, especially the fact that visually impaired participants were significantly older and showed lower trait anxiety levels than

sighted participants. Unfortunately, visually impaired participants are not easy to access and our sample was limited to participants provided by the local ONCE agency in the city of Murcia. Furthermore, the fact that the ONCE group itself was not totally homogeneous must be acknowledged: participants in this group had different economic and academic backgrounds, and even their level of visual disability was not the same. However, this is the reality of the visually impaired population, a highly varied and coloured palette of humans who cannot be easily homogenised.

But despite the difficulties, the present paper offers the first study on the emotional reception of audio described porn films. Results from the study have pointed to the efficacy of audio description for the blind in providing sighted and visually impaired audiences with a similar experience to that offered by original audiovisual porn scenes. Conducting reception studies involving participants with special needs and the measurement of psychological variables is a fascinating journey towards a better and fairer society which aims at making people's lives better and, why not, also sexier.

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