

Analysis Application of Non-diegetic Sound on Animation Movie “Battle of Surabaya” to Human Perception

Charista Elliani¹ and Jack A. Simanjuntak¹

¹*Conservatory of Music, Universitas Pelita Harapan, Kelapa Dua, Tangerang, Indonesia*

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Abstract: Exploration of the used of sound, particularly non-diegetic sound, on animation film has been done frequently. So far, few research has been carried out on the usage of non-diegetic sound. Therefore, research about the impact of non-diegetic sound to human perception while watching films should be done any further to investigate the level of satisfaction from the audience. Data were collected with qualitative method, by distributing questionnaires to two groups consists of 13 respondents, the first group includes of Universitas Pelita Harapan (UPH), Faculty of Art, Conservatory of Music college students whose major in Sound Design & Music Production while the second group includes of Universitas Pelita Harapan (UPH), Faculty of Art, Conservatory of Music college students whose major besides Sound Design & Music Production. Data were analyzed by using validity analysis, reliability, and basic statistic. This study has identified that the usage of non-diegetic sound on film has a significant effect to human perception.

1 INTRODUCTION

One of the biggest industries in the world is film industry, especially animated films (Beane, 2012). The film industry is built to create and sell artworks for the audience. There are several important aspects that can support the storyline in animated film, such as audio. The audio can bring atmosphere to the film that helps audience in understanding the storyline that is conveyed by the director. Therefore, the role of sound technicians in making audio for films is very important to make the audience understand the real intention of every part of the movie (Anestis and Anestis, 2015).

Audio in film production is made by audio post-production division. This division is divided into four major sections – automatic dialogue replacement (ADR), foley, sound effect, and ambience. This journal is focused on research about sound effect. Based on audiovisual theory, sound effect is classified into diegetic and non-diegetic sounds (Cecchi, 2010). Diegetic sound is a sound that can be heard by characters in the film and audience at the same time, while non-diegetic sound is a sound that

can only be heard by the audience themselves, not by the characters in the film (Beauchamp, 2015).

Emotions in a film can not be created only by using images, but mostly by audio, especially the usage of non-diegetic sound (Cecchi, 2015). Diegetic and non-diegetic sounds are processed by the brain to produce different perceptions based on the experience of each individuals (Martin, 1962). Both sounds have enormous influence to human perception.

Therefore, the topic of this study aims to analyze the application of non-diegetic sound in animated film entitled Battle of Surabaya to the perceptions of Universitas Pelita Harapan Conservatory of Music students as respondents. A one-minute scene from Battle of Surabaya will be remade into two different kinds of audio. The first video contains only diegetic sound, while the second video contains a combination of diegetic and non-diegetic sounds.

Respondents are divided into two groups, 13 students whose concentration are in Sound Design and Music Production and 13 students outside that concentration. This research will be conducted using a qualitative method through questionnaire which then distributed to respondents. Respondents have to

compare those two audio-remakes and fill the questionnaire given.

There had been no studies that investigated the effects of non-diegetic sound to human perception. In determine the effects of non-diegetic sound to human perception in animated film.

2 METHODOLOGY

The current investigation involved recording and mixing diegetic and non-diegetic sounds in Battle of Surabaya to examine students' perceptions of non-diegetic sound.

2.1 Research Concept

2.1.1 Production Preparation

The animated film chosen as the object of the research is "Battle of Surabaya" because the film has a warfare background which could be explored more in the application of non-diegetic sound. Non-diegetic sound has an important role in causing emotional warfare situations even though the film is an animated work (not real).

The one-minute scene was analysed in each shot. Diegetic and non-diegetic sound that were going to be used were determined after scene analysis. Diegetic sound that would be used are wind, explosion, flame, running footsteps, people screaming, planes, etc., while non-diegetic sound that would be used are low frequency, distortion, whoosh, low frequency impact, etc. Furthermore, diegetic and non-diegetic sound that had been classified would be recorded, collected, and edited into sound bank as well as the mixing process such as giving filters, reverberation time, balancing, and panning.

2.1.2 Materials

Materials used in this research were Macbook Pro 15-inch 2016 Laptop, Logic Pro X Digital Audio Workstation (DAW), BeyerDynamic DT770 Pro 250 ohm Headphone, Avid Fast Track Duo Audio Interface, and Sennheiser MKH 416 Microphone.

Laptop was used as a medium for audio engineering, DAW was used in editing and mixing audio, headphone was used as hearing aid for researcher to mix the audio and respondents to listen to the audio-remakes, audio interface was used as a tool for processing analogue to digital signal from

this study, subjective listening test is presented to examine respondents' preferences on the impact of non-diegetic sound.

microphone to laptop. Microphone was used to capture and record the sound that is needed to

2.1.3 Questionnaire Making

The questionnaire contains four questions – three closed questions and one opened question. The closed questions contain three main statements of non-diegetic characteristics, which are non-diegetic sound that can influence audience in perceiving ambience sound, perceiving emotions (in this case tense emotion in war), and perceiving supporting objects reality in film. Every closed question consists of four options (which are no effect, small effect, medium effect, and large effect) that respondents have to choose after watching the second video (diegetic and non-diegetic sounds) compared to the first video (diegetic sound).

2.2 Research Procedure

This research was conducted using qualitative methods. This study consisted of four stages. The first stage was a production preparation stage, the second stage was remaking audio stage, the third stage was questionnaire distribution, and the last stage was research results analysis.

In the first stage, production preparation was done by elaborating the movie scene. After that, a list of diegetic and non-diegetic sounds was arranged according to the sound classification that had been made before. Next, the sounds that are needed would be recorded and collected in the form of sound effects. Questionnaire would also be made at this stage.

In the second stage, audio engineering would be done by editing the sound effects and audio recordings, then would be collected to the sound bank. Afterwards, the sound would be synchronized according to the image in both videos. Only the diegetic sound would be applied to the first video, while diegetic and non-diegetic sounds would be applied to the second video. The video chosen was a one-minute video (00:00:30 to 00:01:30). Furthermore, both audios would be processed using filters, reverberation time, balancing, panning, and mixing.

In the third stage, the questionnaire would be distributed to respondents. Respondents had to answer which effects (no effect, small, medium, and

large) they feel after watching the second video compared to the first one and fill the opened question with their opinion about the audio itself.

In the fourth stage, questionnaire analysis on closed questions would be conducted by looking for the highest to lowest percentage of the effects of non-diegetic sound elements in delivering the story, while questionnaire analysis on opened question will be transcribed.

2.2.1 Remaking Audio

Audio compilation would be carried out separately in the first and second video according to the list of sound that had been made previously. After the audio compilation process was completed, audio would be mixed based on each video. Audio would be filtered, given reverberation time, panning, and balanced into one audio unit. Filters that were applied to the audio were adjusted to the objects on the video. For example, using filters by adding low frequencies when an explosion occurs, made the audience able to feel more tension. Reverberation time applied to the audio was adjusted to the space where an object produces sound. If the object produced sound in an open space, the reverberation time produced is small, different from the sound in a large closed empty space. In addition, the sound would also be panned depends on the direction of the sound produced. For example, if a video explosion occurred on the right, then the panning would also be placed on the right side so the audience know where the explosion took place. Then, the audio would be balanced by listening

to all audio in the video at the same time, both diegetic and non-diegetic sound, so that the sounds could be adjusted to one another in balance. The sound needed to be balanced so the audience did not feel disturbed and feel natural while watching the film.

2.3 Research Analysis

After all the results were gathered, data analysis would be carried out by filling in analysis table that had been made before. Table can be seen in Table 1. On each of the first to third questions, there were columns of 0, 1, 2, and 3. 0 states that respondents did not feel any impact after watching the two videos, 1 states that respondents feel small impact, 2 states that respondents feel medium impact, and 3 states that respondents feel large impact. In the fourth question, respondents gave other response to any other perceptions that they felt besides the three previous questions. The answers chosen by the respondents would be highlighted in the analysis table. After that, all answers would be totalled. After getting the total answers to each question, each total answer would be calculated in a form of percentage so that the most and least choices percentage would be known. Percentage was calculated by the formula seen in Figure 1.

$$\frac{\text{TOTAL RESPONDENT EACH SCALE}}{\text{TOTAL OVERALL RESPONDENTS}} \times 100\% = \text{PERCENTAGE}$$

Figure 1 : Percentage Counting Formula

Table 1: Research Analysis Example

RESPONDENT		QUESTION 1				QUESTION 2				QUESTION 3				QUESTION 4
NO.	NAME	0	1	2	3	0	1	2	3	0	1	2	3	
1														Written Answer
2														Written Answer
3														Written Answer
4														Written Answer
5														Written Answer
6														Written Answer
7														Written Answer
8														Written Answer
9														Written Answer
10														Written Answer
11														Written Answer
12														Written Answer
13														Written Answer
TOTAL		0	4	5	6	0	5	5	6	0	8	4	3	
PERCENTAGE		0) 0/13 x 100% = 0% 1) 4/13 x 100% = 30,77% 2) 4/13 x 100% = 30,77% 3) 5/13 x 100% = 38,46%				0) 0/13 x 100% = 0% 1) 4/13 x 100% = 30,77% 2) 5/13 x 100% = 38,46% 3) 4/13 x 100% = 30,77%				0) 0/13 x 100% = 0% 1) 7/13 x 100% = 46,67% 2) 3/13 x 100% = 20% 3) 3/13 x 100% = 20%				

3 RESULT AND DISCUSSION

Figure 2 displays a chart of sound design students questionnaire results. In question 1, no respondent (0%) answers 0 (no effect). Meanwhile, two respondents (15%) answer 1 (small effect), five respondents (38%) answer 2, and six respondents (46%) answer 3 (large effect).

In question 2, no respondent (0%) answers 0. Meanwhile, one respondent (8%) answers 1, seven respondents (54%) answer 2, and six respondents (46%) answer 3. In question 3, no respondent (0%) answers 0. Meanwhile, one respondent (8%) answers 1, four respondents (31%) answer 2, and eight respondents (62%) answer 3.

Meanwhile, figure 3 displays a chart of non-sound design students questionnaire result. In question 1, no respondent (0%) answers 0 (no effect) and 1 (small effect). Meanwhile, there are seven respondents (54%) answer 2, and six respondents (46%) answer 3 (large effect).

In question 2, there is one respondent (0%) answers 0. Meanwhile, there is one respondent (8%) answers 1, one respondent (8%) answer 2, and 11 respondents (85%) answer 3. In question 3, no respondent (0%) answers 0. Meanwhile, one respondent (8%) answers 1, two respondents (15%) answer 2, and ten respondents (77%) answer 3.

Based on these two figures, it can be concluded that the two groups of respondents feel significant effect after watching the second video compared to the first one. None of the respondents feel no effect

and very small number of respondents feel small effect from both groups.

Meanwhile, it can be seen that sound design students' answers between the option 2 and 3, do not have a great difference in percentage, while non-sound design students' answers between choice 2 and 3, have a significant difference in percentage. This can be caused by the perspective of non-sound design students who do not study and have any information about the sound itself so they will perceive anything they heard neutrally, different from sound design students who study about sound, especially audio post-production. They perceive sound differently depending on their knowledge, opinion, and experience on sound. Each individuals can have different preferences regarding the sound itself. However, even though each individuals has their own thoughts, it can be concluded that all sound design respondents do feel the impact after watching the second video compared to the first one.

The application of non-diegetic sound is very influential, either small or large, on human perception. Non-diegetic sound plays a role in influencing human subconscious, especially in terms of the sound of ambience, emotional tension, and reality of objects. Non-diegetic sound can improve human perception of the object they are watching and make humans have more sense of unity to the film itself. Therefore, the application of non-diegetic sound to a film greatly determines the emotion of the film so that the message hidden in the story can be conveyed optimally by the director to audience.

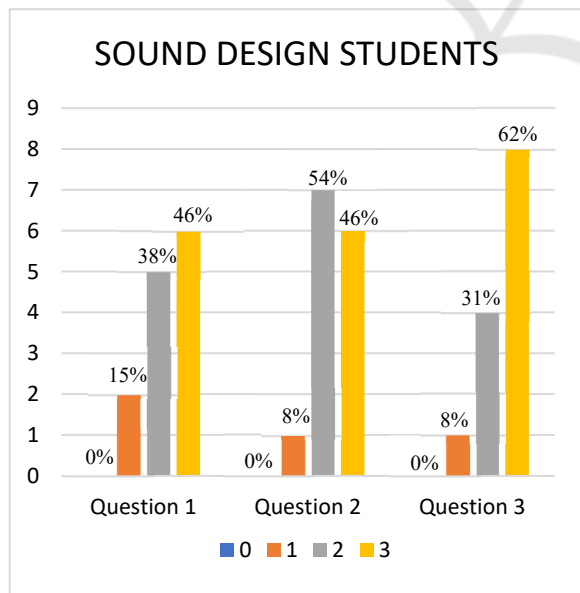


Figure 2: Sound Design Students Questionnaire Result

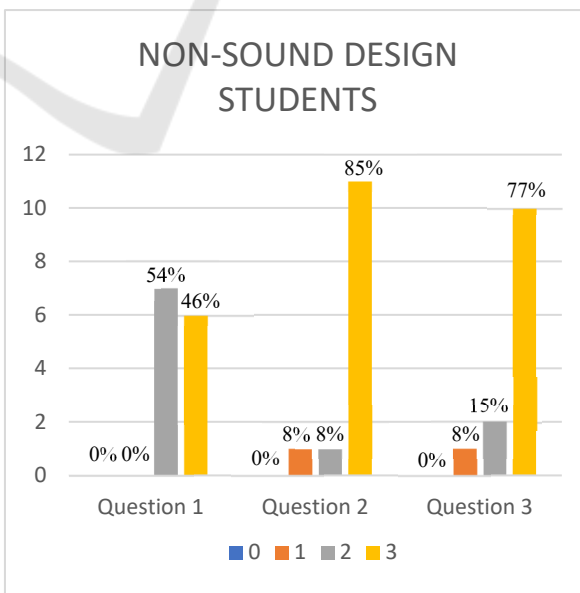


Figure 3: Non-Sound Design Students Questionnaire Result

4 CONCLUSIONS

The main goal of the current research is to analyze the application of non-diegetic sound in animated film entitled Battle of Surabaya to the perceptions of Universitas Pelita Harapan Conservatory of Music students as respondents. This study has shown that the application of non-diegetic sound to animated films is very influential on human perception because it can produce emotional situations that are more dramatizing in audience subconsciousness. The result of this study indicates that respondents felt that the second video seemed more real due to the use of non-diegetic sound compared to the first one. The addition of non-diegetic sound that is actually not a real sound is very necessary to be combined with the use of real sound (diegetic sound). The application of diegetic sound without being added to non-diegetic sound will make the film feel more monotonous because the absence of emotions itself in the film.

Further research might be explored on another film genres, besides animated films, as research variable so the use of non-diegetic sound can be compared from one genre to another.

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