

# The Impact of Fear on the Playcount of Horror Audiobooks

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**Abstract.** With innovations in the technology of smartphones in recent years, audiobooks have become increasingly popular, especially in times of coronavirus pandemics. Does the emotion in the audio have a positive effect on the playcount? Previous studies have addressed this issue primarily by considering emotional expression as static and attending to the overall or average level of expressed emotion. We analyzed data in 271 audios, using the speech emotion recognition technology. The discoveries shed light on the advantages of a higher density of fear. Moreover, the maximum duration of fear in audio has a positive relationship with playcount.

**Keywords:** Horror Audiobooks; The emotion of fear; Audiobook playcount.

## 1. Introduction

Audiobooks have grown in popularity in the book industry over recent years [1]. With innovations in smartphone, audiobooks, podcasts, and the other forms of listening entertainment have become increasingly popular, especially during the coronavirus pandemic [1]. With the development of information technology, many online audiobook platforms have appeared in the world, such as Himalaya, Audible, and iFlytek. NPD Group reports that as of May 2020, unit sales of digital audiobooks have increased by 15%. The AAP figured that as of the end of October, audiobook sales increased by 17.3%. Omdia's latest digital audio book projections predict that consumer revenue from digital audio book service subscriptions and single purchases is expected to increase to \$4.8 billion in 2021 and exceed \$4 billion in 2020.

According to APA's 2010 survey on audiobooks, suspense/thriller topped the list by 31%. In 2019, suspense/thriller still tops the list [2]. Since different types of audiobooks should have different types of voice, this study uses horror audiobooks to study the impact of voice on playcount. Horror entertainment is a thriving industry [3]. People will be attracted by horror entertainment, stories designed to evoke negative emotions, and leisure activities [4]. Horror fiction usually has blood, darkness, madness and emotional repression as central themes, evoking fear and dread in the audience [5]. From horror entertainment, horror audiobooks and horror movies, people are looking for excitement and expect to get fear emotions from them [6-7]. Whether the fear released by audio will increase the audio playcount. For the horror audiobooks, whether releasing more fear emotions will attract users more is a question worth pondering?

We aim to research how the emotion of fear in the audio of horror audiobooks affects the playcount. First, we use audio mining technology to realize the audio emotion recognition of audiobooks. We divide the audio of audiobooks into emotions such as fear and neutrality. Second, we investigate the impact of the density of fear and the maximum duration of fear on the playcount of audiobooks. Our results show that the density of fear emotion displayed in whole audio has a positive impact on playcount, and the maximum duration of the fear emotion displayed by the audio of the book has an positive relationship with playcount.

## 2. Literature Review and Hypothesis

The recognition and measurement of emotions have been extensively studied in the field of social sciences. fMRI allows researchers to identify neural activity associated with certain discrete emotions as well as emotional potencies by measuring changes in blood flow and oxygen use to identify areas of enhanced brain activity [8-9]. By comparison, Electroencephalography is not able to determine the position of brain activation, but rather to indicate when the global neural reaction

takes place, which makes it useful in research where timing is important. [10]. In addition, many scholars use questionnaires to measure people's emotions [11-13]. Due to cognitive reasons, using questionnaires to measure emotions can easily cause measurement errors. Neither questionnaires nor fMRI can be used to measure emotions in voice.

For horror audiobooks, the horror emotions released by the audio will affect whether the user is immersed in the horror atmosphere, thereby affecting the subsequent audio playcount. We want to study the impact of fear on the playcount of horror audiobooks. Thus, the recognition and measurement of fear emotion is crucial. Table 1 shows some literature on emotion measurement and the methods used in this study. The event systems theory believes that in order to better understand the impact of events, academics are not supposed to only look at the intensity of events (the density of fear), but also the duration of the event (duration) and when it occurs (stage) [14]. Therefore, in addition to considering the density of fear, we also studied what the maximum duration of fear should be to achieve the best results. There is a lot of evidence that flow experience can increase user stickiness [15]. Flow experience leads to positive attitudes and continuance intentions, and creating flow is a key factor in increasing customer engagement [16]. Those who pursue horror entertainment are to experience the emotions of fear from it [6]. When the emotion of fear is abundant, are users more immersed in it and continue to participate in it? For horror audiobooks, when the user is immersed in the emotion of fear, whether the user will continue to read to increase the amount of audio playcount? Overall, we propose the following hypothesis:

*Hypothesis1: For a horror audiobook, the density of fear displayed in whole audio has a positively impact on playcount.*

In this study, we draw on event systems theory to explore a distinct temporal dimension of fear: maximum duration of fear. Event system theory suggests that to better understand the effect of events, scholars that should not only study the intensity or strength of an events (i.e., in this research, the density of fear) but also how long events last (duration) [14]. Indeed, relevant studies have demonstrated that the duration of the events is also important while keeping the intensity level of the events' constant. Thus, we contend that the maximum duration of fear moments in an audio may influence the funding results. Specifically, we propose that the maximum duration of fear moments in an audio has a positive relationship with playcount. For one, event systems theory indicates that the more an event lasts, the greater its impact. Overall, we propose the following hypothesis:

*Hypothesis2: In the process of listening to the book, the maximum duration of the fear displayed by the audio has a positive relationship with playcount.*

### 3. Data and Methodology

#### 3.1 The Impact of fear density of fear on Playcount

We use the data from the Himalaya Listening Book platform to test our hypothesis, where the anchor releases the audio of the novel to the public. We randomly selected one day (August 7, 2021) to obtain information about 370 free horror novels. This information mainly includes the title of the book, the score of the book, the playcount of the first two chapters, the audio of the first chapter and the anchor information, etc. Since the audio duration is too short to allow us to obtain a meaningful difference in the emotion of fear in the audio analysis process, we only analyzed the audio duration of more than 120 seconds. Therefore, our final sample includes 271 horror novels.

#### 3.2 Variables

**Playcount.** To test whether the emotion of fear will attract users to continue reading, we use the playcount of the second chapter of the book as the dependent variable. Due to the large difference in the dimension of this variable, we standardized it before the analysis.

**Density of fear.** We cut each audio into short audio, and each short audio lasts one second by python. In all 271 audios, each audio has an average of 770 seconds. There are some segments without sound at the beginning or end of each audio, so we removed the first three seconds and the

last three seconds of each audio. We use the AI to predict the emotion of each short video. In this way, we can calculate the total number of seconds of fear in each audio.

**Maximum duration of fear.** The maximum duration refers to the maximum value of the time during which fear emotions continuously appear in the entire audio.

### 3.3 Control Variables

We considered two kinds of control variables. The descriptions of control variables are displayed in Table 1. The first information is about the anchor of each book. This information mainly includes the gender of the anchor, the number of anchors, and whether it is a signed anchor on the Himalaya platform. Since we can only get the anchor of this book if it is single or multiple, we define the number of anchors as a dummy variable. The second is some information about the content of the book. Here mainly includes whether the title of the book contains words such as fear, the diversification of book types, the score of the book, and the comment hot of the book. We use python to identify whether the title of the book contains words such as fear through regular expressions. Each book will have a variety of tags, and we use the number of tags to measure the diversity of book types. Comment hot refers to the number of comments in the first chapter divided by the number of views in the first chapter.

Table 1. Descriptive Statistics

Variable	Obs	Mean	SD	Min	Median	Max	Description
Density of fear	271	0.23	0.03	.1466	.233	.3378	
Maximum duration of fear	271	6.06	3.55	3	5	45	
Playcount	271	447005.16	1.25e+06	2236	96029	1.09e+07	
The fear of title	271	0.20	0.40	0	0	1	Dummy variable, 1 = Contains fear, 0= No fear
Score	271	9.28	0.49	6.1	9.4	10	
The number of tag	271	5.99	1.08	4	6	9	
Signed anchor	271	0.25	0.43	0	0	1	Dummy variable, 1 = Signed, 0= Unsigned
Coment hot	271	0.00	0.00	0	.0008	.0099	
The number of anchors	271	0.22	0.41	0	0	1	Dummy variable, 1 = multiple, 0= single
Genda	271	0.29	0.45	0	0	1	Dummy variable, 1 = female, 0= male

## 4. Results

The regression results are displayed in Table 2. Due to differences in data dimensions, we performed standardization before analysis. Model 2 and Model 3 deeply study the influence of the density of fear on playcount. Our analysis (Model 2) revealed a significant relationship between fear density and audio playcount ( $\beta=0.245$ ,  $p<0.01$ ), which provides support for Hypothesis 1. This finding, combined with the results of the control variables analyzed in Model 1, suggests that

density of fear is a crucial predictor of playcount. An increase of one unit in fear density results in a corresponding increase in raised playcount by 0.245 units. Hypothesis 2 concerns the effect of the maximum duration of fear on playcount. We added the maximum duration of fear. We found that the variable has a positive effect ( $\beta=0.325$ ,  $p<0.05$ ). Hence, Hypothesis 2 was supported.

Table 2. The Regression Results

	Model 1	Model 2	Model 3
	Dependent Variable: Playcount		
CV	Y	Y	Y
Density of fear		0.245***	0.195***
		-4.08	-3.03
Maximum duration of fear			0.325**
			-2.37
Constant	0.058	0.094	0.106
	-0.63	-1.06	-1.19
N	271	271	271
R-Square	0.03	0.088	0.108
Adj.R-Square	0	0.06	0.07

## 5. Discussion

Our work evaluates the degree to which the horror emotions in the audio contribute to the playcount of horror audiobooks. By analyzing audio data from 271 audiobooks, we have gained some meaningful insights. By controlling book-related information and anchor information, we found that fear emotions have a unique influence on the playcount of audio. Interestingly, we also found that the maximum duration of fear emotions has a positive relationship with the playcount. To sum up, our results contribute to the development of the literature on a few valuable fronts, propose productive routes for future study. The fruits of this study have yielded some valuable practical insights. This research reveals that when the anchor is making audio for horror novels, the emotion of fear is one of the key factors. The higher the density of fear in the audio, the greater the playcount of audio. This study also deciphered the apparent association that density and duration of displayed fear have with playcount.

## 6. Conclusion

This research uses speech emotion recognition technology to extract the emotions displayed in the audio and then studies the influence of the emotion of fear on the playcount. Our results show that the density of fear emotion displayed in whole audio has a positively impact on playcount and the maximum duration of the fear emotion displayed by the audio of the book has a positive relationship with playcount.

## 7. Limitation

This paper makes valid results, but with limitations: First, we only studied the emotion of fear in the audio. As we all know, the plot of the story is ups and downs, and the emotion should be constantly changing. The combination of different emotions may have different effects on the playcount. Thereby, in future research, we will pay more attention to what kind of emotion combination will attract users more. Second, we only considered horror audiobooks. Fear emotions have a positive effect on the playcount of horror audiobooks. However, for other types of audiobooks such as fantasy, romance, etc., what kind of emotions will affect the amount of playback is worth investigating. Third, since we can only get free audiobooks, for audiobooks that need to be paid, whether the horror affects the playcount remains to be studied.

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