

***Investigating the Influence of Movie Genre on Mood
Using Nonparametric Methods***

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Abstract

There has been several studies related to investigating the relation of mood and personality with entertainment domain for various reasons. Recent studies with the help of huge number of data made it possible to have a better understanding of mood regulation and how it is influenced by the entertainment industry. Although the recent studies were promising, there exist many vague and unknown aspects to shed light on. In the present study, nonparametric methods were used to investigate the influence of watching specific movie genres (horror, comedy, and romance) on mood from a filled questionnaire of 30 participants. In addition, the relation of the personality types of these participants with movie genre preferences was analyzed using a nonparametric method. The results revealed that: 1) There is a significant evidence that watching a particular movie can influences some mood components; 2) There was enough evidence to conclude that Conscientiousness and Openness personality traits can be predicted by Romance genre movies with certain confidence levels, but there was not enough evidence to find any particular relation between other personality traits with any movie genres; 3) There are evidences that watching movies can be used as a part of psychotherapy technique to treat mood disorders, and not all movie genres are suitable for people who are suffering from mood disorders.

Keywords: Mood, Nonparametric Methods, Personality, Movie Genre

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Introduction

It sounds true that personality traits and mood states can highly effect choosing the movies someone shows interest to watch (Strizhakova & Krcmar, 2007), but discovering the exact effects of watching specific genre of movies on our mood and emotion is still under study. In several studies, movies were used as a stimulus to evaluate the effects on mood and emotion since few decades ago (Payne et al., 1998). To investigate it in more details, leisure researchers were testing it on various movie genres. As examples: 1) Romance genre of movies was used to check whether it can have effects on warming up the physical coldness of individuals (Hong & Yacheng, 2012); 2) The effects of horror movies on mood were investigated by Sauchelli in details (Sauchelli, 2014); 3) Individuals were exposed to comedy clips to investigate whether it will result into their higher positive mood states or not (Lepori, 2015). Although the researchers use movies as a stimulus to test the effects on mood for different reasons, it is clear that more studies are needed to distinguish between the effect of each one of these movie genres on mood more vividly.

One of the main methods to quantitatively investigate mood has been dimensional structure models. Most scientists agree that there are two independent dimensions which can describe mood. They were named Pleasure/Valence (P) and Arousal (A) (Mehrabian & Russell, 1974). It is also possible to divide these dimensions to sub-dimensions. For example, Positive Activation and Negative Activation can be considered as sub-dimensions of Valence (Watson & Tellegen, 1985), and Arousal dimension has been suggested to be divided into four sub-dimensions (Thayer, 1990). There were studies which have shown that there are evidence of more independent dimensions of mood. For example, Mehrabian proposed Pleasure, Arousal, and Dominance (PAD) as three almost independent dimensions of mood (Mehrabian, 1996). Finally, these types of dimensional structure models can be used to identify novel treatments for affective disorders (Mehraei, 2018; Mehraei, 2019; Mehraei, 2020).

In this study, two independent dimensions P and A were used to measure the core affect (Russell, 2003) of the participants before and after watching 3 genres of movies (horror, comedy, and romance). In addition, their personality was measured using OCEAN big five personality traits. Nonparametric methods were used to find: 1) whether the personality traits have a influence on movie preferences; 2) whether there is a significant influence of watching a specific movie (based on genre) on the mood states of individuals.

Materials and Methods

Sampling and Data Collection

The sample in this study included 30 volunteers, who were from various countries with different backgrounds. About 53% of the sample were female, and the age range was from 21 to 40 years old for both genders. The data collection was divided into two parts: 1) Big five personality trait test to collect the data about Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism (OCEAN) personality traits (Goldberg, 1992) of the participants; 2) Measuring the core affect of participants based on Pleasure (P) and Arousal (A) mood dimensions after watching random movies for an hour. Three genres of movies (horror, comedy, and romance) were shown to the participants in 3 separate days to obtain P and A values for all the distinct genres. Whenever there was a positive change in any of mood dimensions, P and A could get +1 value, but in case of negative change and no change, P and A could get -1 and 0, respectively. These subjects were not asked to fill the questionnaire

anonymously, because there was no reason to answer the questions wrong on purpose. The author knew the subjects personally, and the second evaluation with the participants were made to find the most accurate answers. Therefore, the big number of sample size was sacrificed to have more accurate data collection in this study.

Describing Mood Using Quantitative Methods

Measuring mood states is not an easy task because it depends on various factors and it is complicated to describe its nature for each of its state, but it is much simpler to measure the core of mood and emotion which is known as core affect (Russell, 2003). Pleasure (P) and Arousal (A) are known to be the most important independent factors to describe someone's mood. The presence and intensity of each one of these independent components can define a mood state in a simplified way (Mehrabian & Russell, 1974). In this study, P and A were used as main components of mood to measure someone's mood before and after watching a specific genre of movie. To measure the intensity of P and A was out of scope of this study. However, by measuring the intensity of P and A in the future studies, it will be possible to find novel psychotherapies for patients who are suffering from mood disorders. In Figure 1, P and A were illustrated to show how meaningful they are in order to investigate the interaction between mood, perception, cognition, and behavior using quantitative methods.

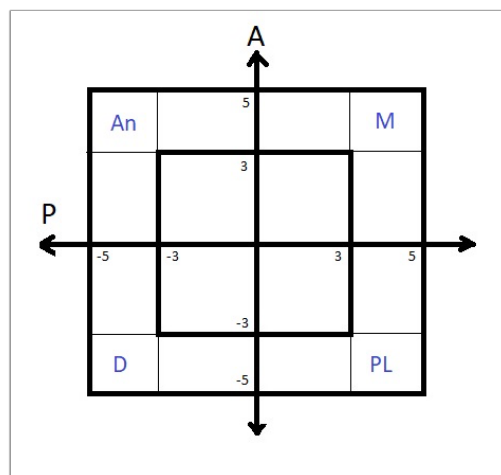


Figure 1: P = Pleasure; A = Arousal; An = Anxiety; D = Depression; M = Mania; PL = Pleasant Laziness (Mehraei, 2019).

Nonparametric Methods

To use a specific statistic in the hypothesis testing, a researcher should be careful about the population assumptions related to the corresponding distribution and its parameters. However, in most of the studies, the distribution of the population and its parameters are unknown. Many researchers can solve this problem by taking a large sample size and using the central limit theorem in statistics. However, collecting data using large sample size can be time consuming, costly, and sometimes impossible. Therefore, nonparametric methods can be used as a method to deal with test-statistics to predict the unknown parameters of the population. In this study, nonparametric methods were used to test the possible relations between personality and mood states with watching specific movie genres.

Results and Discussions

As explained in sampling and data collection section, the big five personality test of each participant was measured using Goldberg's method (Goldberg, 1992). The possible value for each of the Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism personality traits can be a number between 0 to 100. The change of P and A mood components was measured for each individual after watching a specific genre of movie. The results are shown in Table 1.

Table 1: O = Openness, C = Conscientiousness, E = Extroversion, A = Agreeableness, N = Neuroticism, H-P = Change of Pleasure after watching a Horror movie, C-P = Change of Pleasure after watching a Comedy movie, R-P = Change of Pleasure after watching a Romance movie, H-A = Change of Arousal after watching a Horror movie, C-A = Change of Arousal after watching a Comedy movie, R-A = Change of Arousal after watching a Romance movie

Individual Number	O	C	E	A	N	H-P	C-P	R-P	H-A	C-A	R-A
Individual 1	80	60	40	30	50	-1	1	-1	1	-1	1
Individual 2	50	100	50	50	70	0	1	1	1	0	1
Individual 3	50	70	50	40	60	1	0	-1	0	1	1
Individual 4	70	90	50	70	70	-1	1	1	1	1	-1
Individual 5	65	57	35	7	75	-1	1	0	1	1	0
Individual 6	90	50	30	60	70	-1	1	0	1	-1	-1
Individual 7	30	90	30	70	70	-1	1	0	1	0	0
Individual 8	30	80	60	50	60	-1	1	0	1	0	0
Individual 9	70	100	50	50	40	-1	1	1	1	1	-1
Individual 10	30	70	20	80	85	0	0	1	1	-1	1
Individual 11	80	70	100	70	50	-1	0	1	-1	0	1
Individual 12	60	80	50	70	80	-1	1	1	1	0	-1
Individual 13	90	30	95	25	10	-1	1	1	1	-1	-1
Individual 14	100	100	80	40	30	-1	1	1	0	-1	-1
Individual 15	60	90	50	65	40	-1	1	1	1	-1	-1
Individual 16	60	90	20	90	30	0	1	1	0	-1	-1
Individual 17	10	70	30	90	5	-1	1	1	1	1	-1
Individual 18	100	90	70	60	30	0	1	1	0	-1	-1
Individual 19	50	30	80	30	30	-1	1	0	1	-1	0
Individual 20	95	100	60	90	30	0	1	-1	1	1	-1
Individual 21	75	90	30	20	40	0	1	1	1	1	-1
Individual 22	80	80	70	50	60	-1	1	1	1	-1	-1
Individual 23	60	90	50	40	50	-1	1	1	1	-1	-1
Individual 24	50	80	80	80	50	-1	1	1	-1	1	1
Individual 25	50	55	65	35	45	0	1	0	1	-1	1
Individual 26	80	80	10	80	60	0	1	1	0	1	-1
Individual 27	50	90	70	60	20	0	0	1	1	0	-1
Individual 28	50	70	30	50	100	1	1	-1	1	0	-1
Individual 29	50	75	65	90	35	-1	1	0	1	1	0
Individual 30	100	70	90	75	40	1	1	-1	1	1	0

Spearman correlations as nonparametric correlations were calculated for all the attributes in Table 1 to investigate for any evidence for meaningful relations. There was not enough evidence to find any relation between watching comedy or horror genre of movies and OCEAN personality traits. However, a positive relation ($r = 0.419$) for watching Romance movie was detected between Conscientiousness personality trait and Pleasure mood component with p-value 0.021. Moreover, two negative relations were observed from watching Romance movie: 1) Conscientiousness personality trait and Arousal mood component with p-value 0.038 ($r = -0.381$); 2) Openness personality trait and Arousal mood component with p-value 0.038 ($r = -0.38$). In addition, two internal negative relations were observed for personality traits and mood components separately: 1) Extroversion and Neuroticism with p-value 0.015 ($r = -0.438$); 2) Pleasure and Arousal mood components for watching a Romance movie with p-value 0.044 ($r = -0.371$).

Relative frequency of mood components (P and A) was constructed based on the movie genres in Table 2. The constructed relative frequency can be used as the test-statistic for nonparametric sign test and then to be compared with binomial distribution to find the level of confidence and p-value. Clearly, normal distribution can't be used because Central Limit Theorem can't be used with such small sample size.

Table 2: Relative frequency of mood components based on movie genres. The maximum values were given in the table, and P = 0 and A = 0 didn't take any maximum relative frequencies.

	P = +1	P = -1	A = +1	A = -1
Horror		60%	76%	
Comedy	86%			40%
Romance	60%			57%

Running nonparametric sign hypothesis tests based on watching a specific movie genre and its influences on mood components of individuals revealed that 1) Horror genre of movies can increase arousal mood component significantly with 99.9% confidence level; 2) Comedy genre of movies can increase pleasure mood component with p-value 0.001 (99.9% confidence level). The interpretation of the results will be given in the conclusion section.

Conclusion

In this study, nonparametric methods were used to test whether the personality traits have an influence on movie preferences, and how significant watching a specific genre of movie can influence someone's mood state. As mentioned in the results section, a positive relation between pleasure mood component after watching a romance genre of movie with Conscientiousness personality trait was detected. This result suggests that those who have high Conscientiousness can increase their pleasure mood dimension by watching a romance genre of movie. So, those with high Conscientiousness personality trait can use this self-regulation method to avoid depression or anxiety based on Figure 1. Interestingly, a significant negative relation was found between Openness and Conscientiousness personality traits and arousal mood dimension after watching a romance genre of movie. This result suggests that those with low level of Openness and Conscientiousness personality traits can increase their arousal mood dimension by watching a romance genre of movie. This method can be used as a self-regulation method to avoid depression and pleasant laziness (Mehraei, 2019) based on Figure 1. In addition, a meaningful negative relation was observed in the results between pleasure and arousal mood components after watching a romance genre of

movie. This result suggests that independent of someone's personality traits and movie preferences, watching romance movies can increase the mood swings and individuals with bipolar mood disorder should avoid watching this genre of movie when they feel either depressed or experiencing manic trait. Moreover, there are other conclusions which can be derived from the results section regardless of personality traits using Table 2 and its corresponding hypothesis tests: 1) watching horror movies can significantly increase Arousal mood component. Therefore, people who suffer from anxiety and manic trait should avoid watching horror movies; 2) watching comedy movies can significantly increase Pleasure mood component. Thus, watching this genre of movies can be useful to avoid depression and anxiety.

Although nonparametric methods were useful to derive interesting conclusions out of the mentioned data in this study, a large number of sample size will be used to repeat the hypothesis testings using normal standard distribution with higher confidence levels in the future studies. Interesting results were obtained in this study to be considered in psychotherapies and self-regulation methods, but to validate the results, experts in clinical psychologists should run tests on patients in practice in the future studies.

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