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# Psychological effects of music on mental health

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***Abstract*---**Music is a great psychotherapy which gives relief from stress. It develops the mind and boosts self-confidence. Music plays a more important role in our life as it has positive effect on our mental health. Here In this research, changing mood from negative to positive by using Psychology term Positive and Negative Affect Schedule (PANAS) mood scale is implemented. PANAS questionnaire is used to take survey to create songs database. Test-retest reliability method is used. The Test-retest is conducted with the same group of participants after a gap of 1 month. The Test-retest correlation between the two sets of scores is evaluated. The correlation value for these data is around +0.93. Psychological effects on health are discussed.

***Keywords*---**music, health, psychology, test-retest reliability.

## Introduction

Music is very important in everyday life [1]. It has high impact on our mental health [2]. By listening motivational songs, our mood can change from negative to positive. Listening to music has various positive impacts such as it can reduce anxiety, blood pressure, etc. It can improve memory, mood, mental alertness, etc. [3,4]. “Music and the Brain” explores how music impacts Music impacts on brain function and it reduces depression as well as improves cognitive and motor skills [6,8,9].

The Positive and Negative Affect Schedule (PANAS) is the very extensively and repeatedly used scale to measure positive and negative affect. Likert scale is used in PANAS questionnaire. It consists of scales to measure both positive and negative affect. Each item is rated on a 5-point Likert scale of 1 (not at all) to 5 (very much). PANAS questionnaire is designed to take feedback from participants about motivational songs and mood upliftment. Feedback is taken from participants for mood upliftment. Based on the PANAS survey, if the

average >=3, then that song is considered in the final respective songs database. To calculate reliability of songs database, Test-retest reliability is used. The Test-retest is conducted with the same group of participants after a gap of 1 month. The Test-retest correlation between the two sets of scores is evaluated. The correlation value for these data is around +0.93 thereby confirming the song is appropriate for that emotion and is then finalized for the songs database. 250 participants were requested for the feedback about how they felt after listening the songs. The participants were 137 male and 113 female and in the age group of 18-45.

**Literature Review**

Importance of music in everyday life and reason to choose music is discussed in [1]. Various health qualities of life measures are discussed in [2]. Impact of music on health, memory, its uses is discussed in [3]. Role and value of music is discussed in [4,5]. Music and stress, value of music on our health and everyday life is discussed in [6,7,8,9,10,11,12]. Psychology term Positive and Negative Affect Schedule (PANAS) is discussed in [13,14,15,16,17,18]. Test-retest reliability is discussed in [19,20,21].

**Proposed System**

Our system discusses various psychological effects of music on human health. Here a music player is designed which changes mood from negative to positive. PANAS survey is taken to create database of Hindi songs. From the widely available Hindi songs database, the songs are categorized as per individual's mood – Happy, Sad, Angry, Fear, and Bored. The Positive and Negative Affect Schedule (PANAS) mood scale is used to gather responses from participants.

**Positive and Negative Affect Schedule (PANAS)**

To share the songs with participants, around 800 Hindi songs were selected. The Positive and Negative Affect Schedule (PANAS) survey had taken from 160 participants about 700 songs. Finally songs database of 500 songs is generated. Here, we had used only Hindi songs.

**Positive and Negative Affect Schedule (PANAS)**

The Positive and Negative Affect Schedule (PANAS) is the psychological term which is extensively and often used scale to assess positive and negative affect [13,16]. PANAS is a self-report questionnaire. In PANAS Likert scale is used. It is of 5 points such as 1. Very Slightly or Not at All, 2. A Little, 3. Moderately, 4. Quite a Bit, 5. Extremely. It is used to take responses from participants. This Likert scale measures both positive and negative affect[14,15].

PANAS is used in various clinical and non-clinical studies. It is used on general people. [13,17,18] .
Positive and Negative Affect Schedule (PANAS) questionnaire
PANAS questionnaire was prepared in order to record the feedback.
PANAS questionnaire for Happy songs:

The participants given feedback and fill questionnaire after listening to the song.

Table.1 PANAS questionnaire – Happy emotion

| SONG | 1 | | | | | |
|---|---|---|---|---|---|---|
| Positive and Negative Affect Schedule (PANAS) | | | | | | |
| PANAS | Indicate the extent you feel below emotions while listening the music | **Very slightly or not at all** | **A little** | **Moderately** | **Quite a bit** | **Extremely** |
| | | 1 | 2 | 3 | 4 | 5 |
| 1 | Happy | | | | | 5 |
| 2 | Sad | | | | | |
| 3 | Angry | | | | | |
| 4 | Fear | | | | | |
| 5 | Bored | | | | | |
| | Your Score on PANAS | | | | | |
| | Positive | 5 | | | | |
| | Negative | 0 | | | | |

Scoring: The participants had to rate on the likert scale how they felt while listening to the song.
Positive Affect Score: The scores on item 1: Happy, with higher scores representing higher levels of positive affect.
Negative Affect Score: Add the scores on items 2: Sad, 3: Angry, 4: Fear and 5: Bored.

**PANAS questionnaire for motivational songs**

Here, PANAS questionnaire is designed to take feedback from participants about motivational songs and mood upliftment. A feedback is taken from participants about mood change. Based on the PANAS survey, if the average >=3, then that song is considered in the final respective songs database.

Table. 2 PANAS questionnaire –Sad, angry, fear, bored emotion

| Did you feel better by listening this song? | | | | SAD → HAPPY | |
|---|---|---|---|---|---|
| Indicate the extent you feel while listening the music | Very slightly or not at all | A little | Moderately | Quite a bit | Extremely |
| | 1 | 2 | 3 | 4 | 5 |

| Did you feel calm by listening this song? | | | | ANGRY → CALM | |
|---|---|---|---|---|---|
| Indicate the extent you feel while listening the music | Very slightly or not at all | A little | Moderately | Quite a bit | Extremely |
| | 1 | 2 | 3 | 4 | 5 |

| Did you feel stronger by listening this song? | | | | FEAR → STRONG | |
|---|---|---|---|---|---|
| Indicate the extent you feel while listening the music | Very slightly or not at all | A little | Moderately | Quite a bit | Extremely |
| | 1 | 2 | 3 | 4 | 5 |

| Did you feel enthusiastic by listening this song? | | | | BORED → EXCITED | |
|---|---|---|---|---|---|
| Indicate the extent you feel while listening the music | Very slightly or not at all | A little | Moderately | Quite a bit | Extremely |
| | 1 | 2 | 3 | 4 | 5 |

**Inviting the participants**

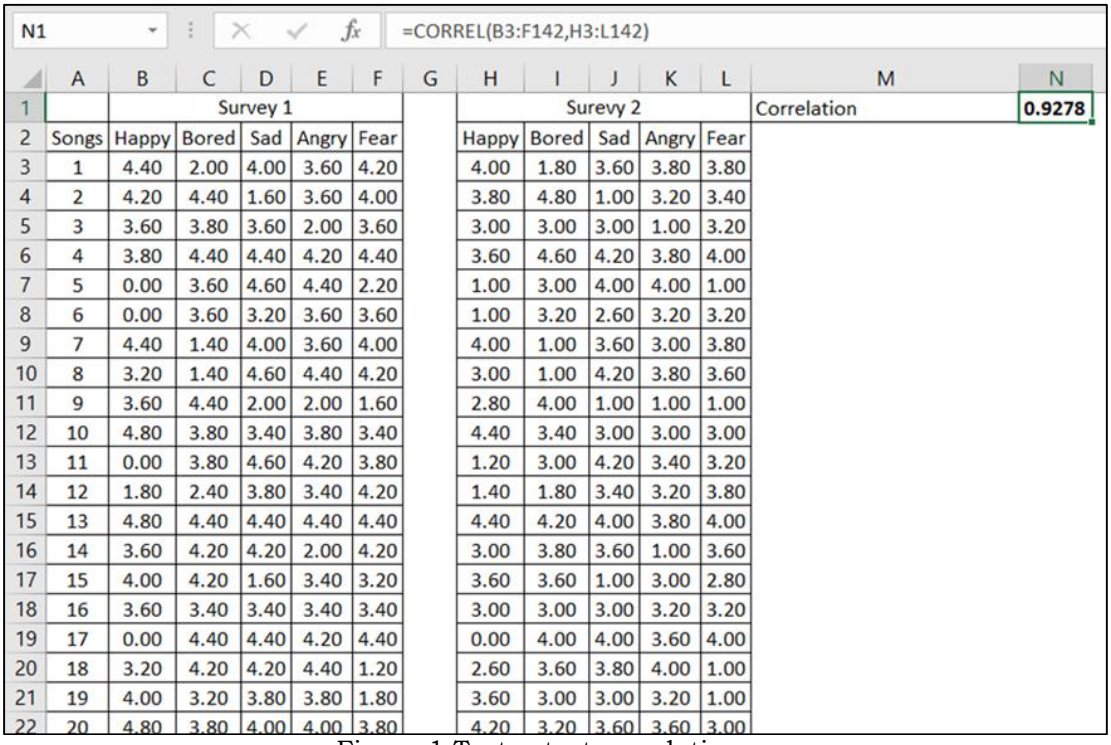
We shared the songs database with 160 participants. Participants were requested to give the feedback via PANAS questionnaire.
Song categorization criteria
Songs database is created based on the feedback from participants. The Figure 5.1 shows a broad idea about song categorization.

**Happy**

Created a database of 140 happy songs. These songs were divided into four groups named - Happy A, Happy B, Happy C and Happy D with each group containing 35 songs. These divided songs are shared with 160 participants. We further divided these 160 people into four groups - Group 1, Group 2, Group 3 and Group 4
Happy A songs group is given to Group 1,
Happy B songs group is given to Group 2,
Happy C songs group is given to Group 3,
Happy D songs group is given to Group 4.
Based on the PANAS survey, if the average >=3, then that song is considered in the final happy songs database.

**Test-Retest Reliability**

Test-retest reliability is evaluated while finalizing the songs database for selected emotions. Test-retest reliability is one of the measure of reliability. It counts is the extent to which test scores remain unchanged in different circumstances [19] . Test-retest reliability measures the stability of the scores from the same person on two or more separate occasions [20,21]. In test-retest assessment, variations in the response are used to estimate measurement error [22,23]. The test-retest is conducted with the same group of participants after a gap of 1 month. The test-retest correlation between the two sets of scores is evaluated. The correlation value for these data is around +0.93 thereby confirming the song is appropriate for that emotion and is then finalized for the songs database.




| | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | Survey 1 | | | | | | Surevy 2 | | | | | Correlation | 0.9278 |
| 2 | Songs | Happy | Bored | Sad | Angry | Fear | | Happy | Bored | Sad | Angry | Fear | | |
| 3 | 1 | 4.40 | 2.00 | 4.00 | 3.60 | 4.20 | | 4.00 | 1.80 | 3.60 | 3.80 | 3.80 | | |
| 4 | 2 | 4.20 | 4.40 | 1.60 | 3.60 | 4.00 | | 3.80 | 4.80 | 1.00 | 3.20 | 3.40 | | |
| 5 | 3 | 3.60 | 3.80 | 3.60 | 2.00 | 3.60 | | 3.00 | 3.00 | 3.00 | 1.00 | 3.20 | | |
| 6 | 4 | 3.80 | 4.40 | 4.40 | 4.20 | 4.40 | | 3.60 | 4.60 | 4.20 | 3.80 | 4.00 | | |
| 7 | 5 | 0.00 | 3.60 | 4.60 | 4.40 | 2.20 | | 1.00 | 3.00 | 4.00 | 4.00 | 1.00 | | |
| 8 | 6 | 0.00 | 3.60 | 3.20 | 3.60 | 3.60 | | 1.00 | 3.20 | 2.60 | 3.20 | 3.20 | | |
| 9 | 7 | 4.40 | 1.40 | 4.00 | 3.60 | 4.00 | | 4.00 | 1.00 | 3.60 | 3.00 | 3.80 | | |
| 10 | 8 | 3.20 | 1.40 | 4.60 | 4.40 | 4.20 | | 3.00 | 1.00 | 4.20 | 3.80 | 3.60 | | |
| 11 | 9 | 3.60 | 4.40 | 2.00 | 2.00 | 1.60 | | 2.80 | 4.00 | 1.00 | 1.00 | 1.00 | | |
| 12 | 10 | 4.80 | 3.80 | 3.40 | 3.80 | 3.40 | | 4.40 | 3.40 | 3.00 | 3.00 | 3.00 | | |
| 13 | 11 | 0.00 | 3.80 | 4.60 | 4.20 | 3.80 | | 1.20 | 3.00 | 4.20 | 3.40 | 3.20 | | |
| 14 | 12 | 1.80 | 2.40 | 3.80 | 3.40 | 4.20 | | 1.40 | 1.80 | 3.40 | 3.20 | 3.80 | | |
| 15 | 13 | 4.80 | 4.40 | 4.40 | 4.40 | 4.40 | | 4.40 | 4.20 | 4.00 | 3.80 | 4.00 | | |
| 16 | 14 | 3.60 | 4.20 | 4.20 | 2.00 | 4.20 | | 3.00 | 3.80 | 3.60 | 1.00 | 3.60 | | |
| 17 | 15 | 4.00 | 4.20 | 1.60 | 3.40 | 3.20 | | 3.60 | 3.60 | 1.00 | 3.00 | 2.80 | | |
| 18 | 16 | 3.60 | 3.40 | 3.40 | 3.40 | 3.40 | | 3.00 | 3.00 | 3.00 | 3.20 | 3.20 | | |
| 19 | 17 | 0.00 | 4.40 | 4.40 | 4.20 | 4.40 | | 0.00 | 4.00 | 4.00 | 3.60 | 4.00 | | |
| 20 | 18 | 3.20 | 4.20 | 4.20 | 4.40 | 1.20 | | 2.60 | 3.60 | 3.80 | 4.00 | 1.00 | | |
| 21 | 19 | 4.00 | 3.20 | 3.80 | 3.80 | 1.80 | | 3.60 | 3.00 | 3.00 | 3.20 | 1.00 | | |
| 22 | 20 | 4.80 | 3.80 | 4.00 | 4.00 | 3.80 | | 4.20 | 3.20 | 3.60 | 3.60 | 3.00 | | |

Figure 1 Test-retest correlation

**Results and Discussion**

To create songs database which uplifts mood, PANAS mood scale is used. By using PANAS questionnaire motivational songs database is created. Test-retest reliability method is used. The correlation value for these data is around +0.93 thereby confirming the song is appropriate for that emotion and is then finalized for the songs database. Music is beneficial to provide relief. It reduces stress. Music can change our life. It changes our mood from negative to positive. Music has high impact on our health as well. Music can boost our mental health as it plays a vital role in mood enhancement [5,10,11,12]. 250 participants were requested for the feedback about how they felt after listening the songs. The

participants were 137 male and 113 female and in the age group of 18-45. The Figure 7.4 highlights the mix of participants.

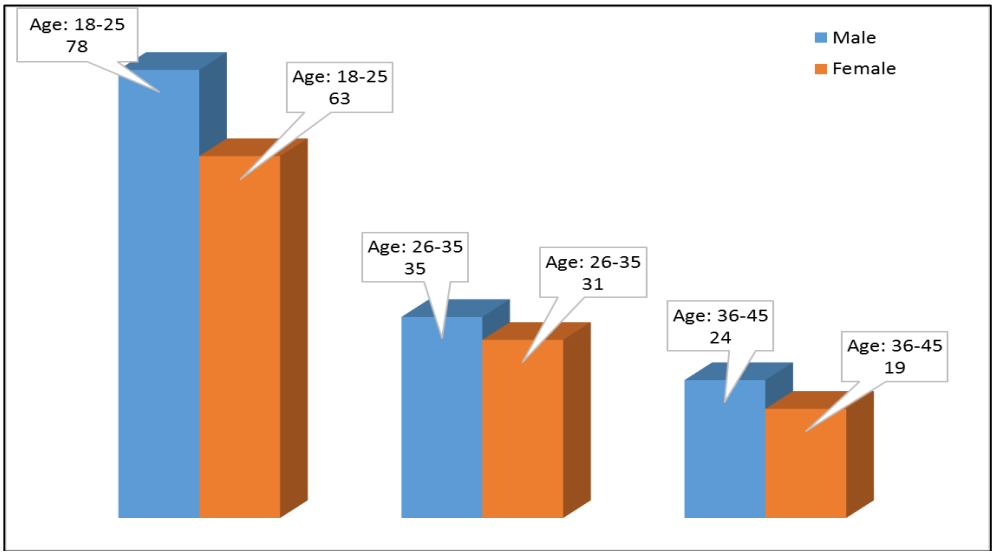



Figure 2 Participants feedback

From the survey as shown in the Figure 7.5 it is clear that 84% participants were reported they felt better.

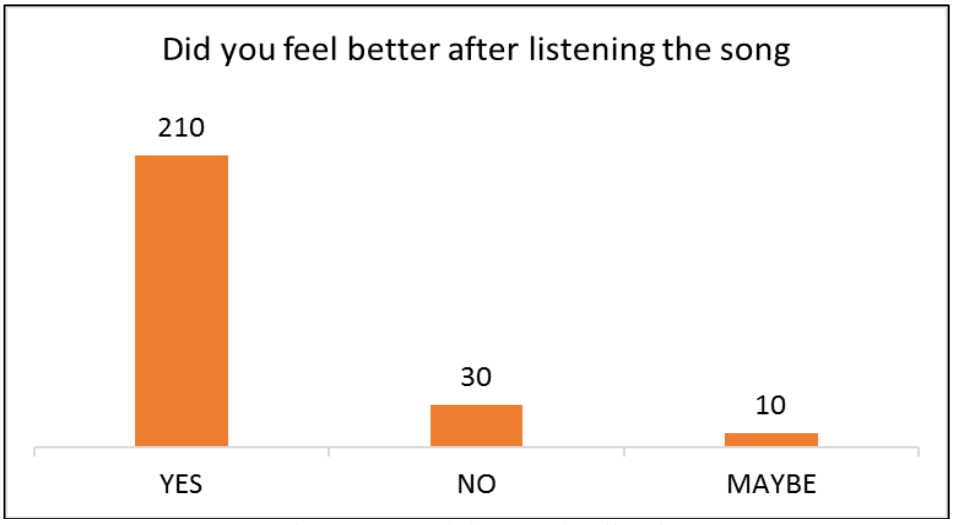



Figure 3 Participants feedback

**Conclusion**

A system is generated which converts mood from negative to positive by using motivational music. Hindi songs database of around 500 songs are created. Positive and negative Affect Schedule (PANAS) mood scale is used to create database. 5 emotions considered: happy, Angry, sad, fear, Bored. Test-retest

reliability is used to check correctness of songs in the database. Test-retest correlation value is +0.93 which is very higher. Feedback is taken from 250 participants in age group 18-45, from which 84% reported positive.

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