Music Listening Hours & Happiness Across Personality Types

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Draft 1: https://eggyd.github.io/dgm6109/term/Draft1

Draft 2: https://eggyd.github.io/dgm6109/term/Draft2

Final: https://eggyd.github.io/dgm6109/term/Final/

Data collection: Music_Personality_Data_Collection

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1. Introduction

The main purpose of this project is to explore whether different personality types influence the amount of time people spend listening to music and the emotional states they experience while listening. Music often serves as a tool for emotional regulation, and personality affects how individuals process emotions, make decisions, and interact with the world. Therefore, through this study, I hope to use visualization to present the relationship among personality, music-listening habits, and emotional experience.

To make this relationship more intuitive, I designed a heart shape made of twenty-seven small squares to represent the daily capacity for music listening.

- Each square represents thirty minutes
- The color transitions from light pink to deep purple reflect Mood values from 0 to 5

Finally, I created five separate heart visualizations, one for each personality type, in order to compare them clearly.

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2. Data Collection

I invited five participants with different personality types, specifically INFP, INFJ, ENFP, ESTJ, and ISFJ. These personality types are based on the MBTI, also known as the Myers Briggs Type Indicator, which is a widely used model for describing personality. MBTI uses four letters to represent an individual's behavioral tendencies:

- **E / I**：Extraversion / Introversion
- **N / S**：iNtuition / Sensing
- **F / T**：Feeling / Thinking
- **P / J**：Perceiving / Judging

I initially designed five different dimensions of data to be recorded:

（**1**）**Mood**（**0–5**）
（**2**）**Stress Level**（**0–5**）
（**3**）**Focus Level**（**0–5**）
（**4**）**Music Genres**
（**5**）**Listen Duration**（**in minuets**）

2.1 Mood

Mood was recorded on a scale 0 - 5. To ensure that all participants understood the scoring system in a consistent way, I provided a description for each value so that the measure remained subjective but still comparable across individuals.

Mood 0: a very low emotional state, lack of motivation, or negative feelings.

Mood 1: a slightly low state and may involve pressure or mild frustration.

Mood 2: reflects a somewhat low condition. It is not entirely negative, but the person is not in an ideal state.

Mood 3: the person feels stable but not particularly positive.

Mood 4: represents a mildly to moderately positive emotional state, such as feeling energetic or calm and pleasant.

Mood 5: highly positive state, the person feels cheerful, motivated, and emotionally strong.

The final purpose of the Mood variable is to serve as the basis for the color gradient in the visualization so that emotional intensity is expressed visually through changes in color.

2.2 Stress Level

Stress Level was recorded on a scale from 0 to 5:

- “0” indicates complete relaxation with no noticeable stress.

- “5” represents very high stress, a sense of urgency, and significant emotional tension.

2.3 Focus Level

Focus Level was recorded on a scale from 0 to 5:

- “0” indicates difficulty maintaining focus.
- “5” represents a high level of concentration and strong efficiency.

Although I initially recorded Mood, Stress Level, and Focus Level together as emotional and psychological indicators, I ultimately chose to include only Mood in the final visualization. The decision was not based on these variables being irrelevant or difficult to quantify. Instead, it was because Stress and Focus did not provide meaningful distinctions that justified treating them as key dimensions.

During the preliminary analysis, I found that the distributions of Stress and Focus were extremely similar to the distribution of Mood. The patterns across personality types were not clearly distinguishable, and the variables were highly correlated with one another.

In other words, although both variables were recorded completely, they did not enhance the understanding of the data during visualization. Including them would have created visual clutter and reduced the clarity of the main trends.

2.4 Music Genres

Participants also reported the main music genres they listened to each day, including pop, rock, indie, electronic, lofi, and others. However, the relationship between music genre, listening duration, and emotional state is highly complex. I decided not to include it in the final visualization in order to preserve clarity. This remains one of the biggest regrets in the project for me, since the music genre is likely to be a meaningful and interesting factor in future studies.

2.5 Listen Duration

Listen Duration is the central variable in this visualization.

Each participant reported the total amount of time they spent listening to music at the end of each day. To convert this information into a visual format, I defined:

each square in the heart shape as representing 0.5h. As a result, a fully filled heart consists of 27 squares, which corresponds to a maximum of 13.5 hours of listening time.

2.6 Recording Method and Frequency

All participants reported the five recorded values at the end of each day.

This recording strategy ensured that the emotional state of the day was not affected by memory errors on the following day and that each day's ratings were provided under consistent conditions.

2.7 Differences in Recording Style Caused by Personality

During the data collection process, an interesting phenomenon emerged and became an additional observation for this project.

- Participants with E, which refers to Extraversion, tended to record their data less consistently. They often forgot to report, submitted responses late, or provided rough estimates.
- In contrast, participants with I, which refers to Introversion, were very precise. They reported almost every day on time and provided clear numerical values.

This suggests that personality may influence not only listening habits but also the behavior of recording data itself. Although this point was not directly reflected in the final visualization, I would be interested in studying it further if I had more time in the future.

2.8 Future Improvements for Data Collection

One major limitation of the current dataset is the significant difference in the participants' daily routines:

Some participants were students while others were working full time, which means their available time for listening to music was inherently different. As a result, the effect of personality was influenced by variations in lifestyle and daily schedules.

In the future, I plan to select participants whose daily rhythms are more similar and who have comparable amounts of discretionary time. This would make it easier to isolate the influence of personality itself and reduce the impact of external factors.

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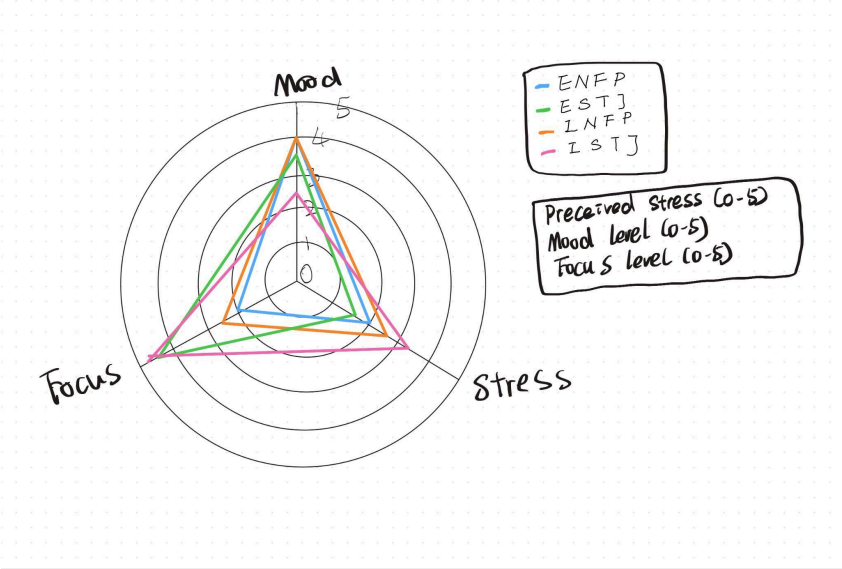
3. Sketches

Before determining the final visualization format, I considered using a radar chart to represent differences across multiple variables for each personality type. A radar chart is capable of displaying several dimensions at once, which makes it theoretically suitable for showing the overall patterns of the five personality types in variables such as listening duration, Mood, Stress, and Focus.



However, although the radar chart is capable of presenting multidimensional data, it was not suitable for the final visual expression of this project for several reasons.

First, a radar chart has a relatively high cognitive load. It requires viewers to understand the meaning of multiple axes and the angular relationships among them, which makes it difficult for them to quickly grasp the differences in listening duration and emotional states across personality types.

Second, this project includes five personality types. If all five sets of data were plotted on a single radar chart, the lines would overlap heavily and the chart would become difficult to read. When I considered separating the radar chart into five individual charts, I realized that once each personality required its own graphic, it would be more effective to choose a visualization that expresses emotional qualities more clearly and offers a visually appealing and theme-appropriate structure. This led me to adopt a heart-shaped visualization, which better aligns with the focus on emotion and music.

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4. Rationale

The data in this project has two key characteristics:

- Listening duration is a cumulative quantity

- Mood represents an emotional state

The heart-shaped grid visualization addresses both of these characteristics effectively:

- the number of filled squares represents the amount of music listening
- the color of each square reflects the intensity of the emotional state
- the overall style of the visualization is friendly, visually appealing, and well suited to the theme of emotion and music.

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5. Findings & Conclusion

5.1 Differences in Listening Duration Across Personality Types

- INFP and ISFJ participants showed noticeably higher listening durations compared to the other personality types.
- ENFP and ESTJ participants had relatively lower listening durations.

This pattern suggests that individuals with I, referring to Introversion, may be more likely to use music as a way to manage or regulate their emotional experiences.

5.2 Differences in Mood

- The ISFJ participant reported the highest Mood score, with an average of 4.6.
- The INFP participant showed a lower average Mood of 3.9.
- The ENFP participant remained relatively stable at 4.1.

These results indicate that the personality type with the highest Mood is not necessarily the one that listens to the most music.

5.3 Interesting Differences in Recording Habits

Personality also appeared to influence the way participants recorded their data:

- Participants with E, referring to Extraversion, often forgot to report or provided approximate values.
- Participants with I, referring to Introversion, were very consistent and precise in their recordings.

This is an intriguing observation from a psychological perspective and is a finding that could be explored further in future research.

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6. Self-Analysis

6.1 What I Initially Planned to Explore and How the Project Evolved

At the beginning of the project, I planned to study the relationship between music genres and emotional states.

However, I soon realized that music genres are difficult to quantify, and a single day often includes many different types of music. For these reasons, I shifted the focus of the project to the relationship among personality, listening duration, and mood.

6.2 What did I Learned

As I worked through this project, I gradually realized the importance of maintaining a clear and thoughtful code structure. First, I tried to avoid writing code in which a small change would affect multiple other functions, since this would create a chain reaction every time I needed to make an adjustment. I wanted to prevent a situation where modifying one detail would require rewriting large parts of the program.

Second, I made a deliberate effort to separate the data logic from the drawing logic. This structure allowed me to ensure that the data was processed correctly before passing it to the visualization components. When I later adjusted visual elements such as layout or styling, I did not need to touch the data-processing portion at all. This separation greatly improved the flexibility of the project and made future updates and modifications much easier.

Finally, although the course encouraged creativity and playful visual design, I came to understand that the most important qualities of a successful chart are clarity and the efficient delivery of information. Viewers should be able to understand the main message of a visualization within a very short amount of time. Visual creativity can enhance the experience, but it should never replace readability. Creativity supports visualization; it does not substitute for clear communication.

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7. Future Work

The major limitation at this stage is the large difference in participants' daily identities and schedules. Some participants were students while others were working full time, and their available free time differed significantly. This affected both their listening duration and their emotional states.

For future improvements, I plan to recruit participants who share similar roles and daily rhythms so that the influence of personality can be observed more clearly without being overshadowed by lifestyle differences.

I would also like to include additional variables in future data collection, such as whether the participant listens during commuting, whether they use music to relieve stress, and how different Mood levels influence their choice of music genres.

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8. Works Cited

“Heart Visualization.” *Tableau Public*, https://public.tableau.com/app/profile/ellen4268/viz/heart_17176865031980/2.

During the process of designing the final visualization, I referred to a heart-shaped data visualization created by a Tableau Public user (Heart Visualization, Tableau Public). That work uses a structured grid to form a heart shape and employs filled squares as a way to represent quantitative information.
