The effect of music on mental health

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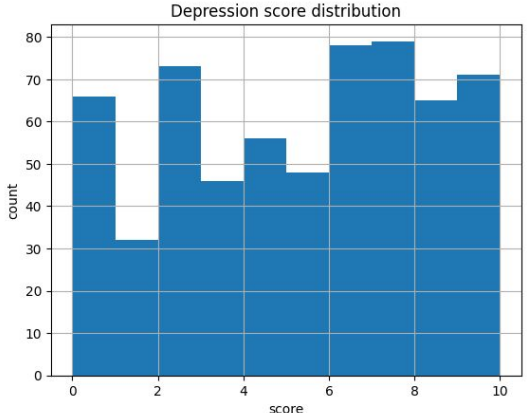
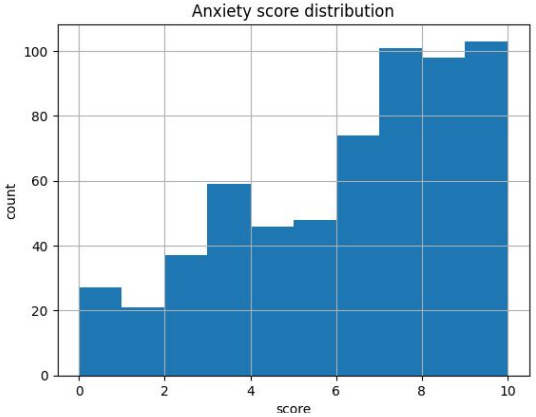
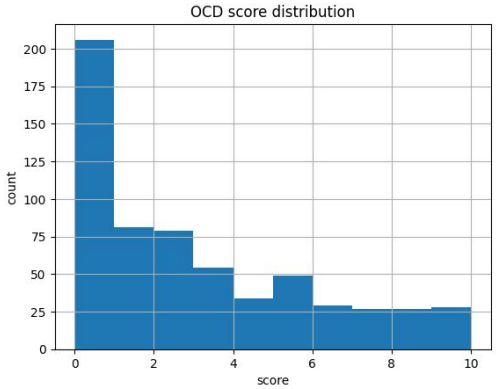
Dataset

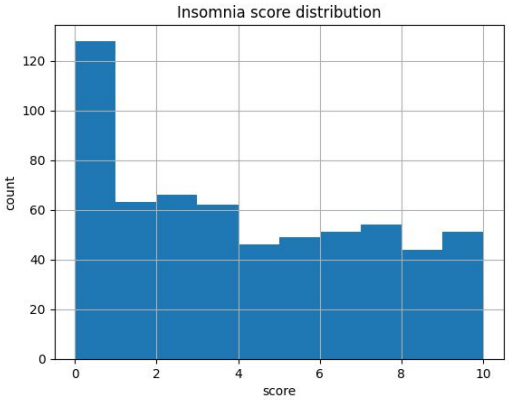
- We used the Music & Mental Health Survey (MxMH) dataset
  - Contains survey data from 736 respondents, with their age, music-listening habits (hours per day, whether they compose or play an instrument, if they listen to music in foreign languages, etc.) and their self-reported anxiety, depression, insomnia, and OCD from 0-10.
  - Data was cleaned by converting one-hot encoding categorical data and filling missing numerical values with the median for their column.

Data insights





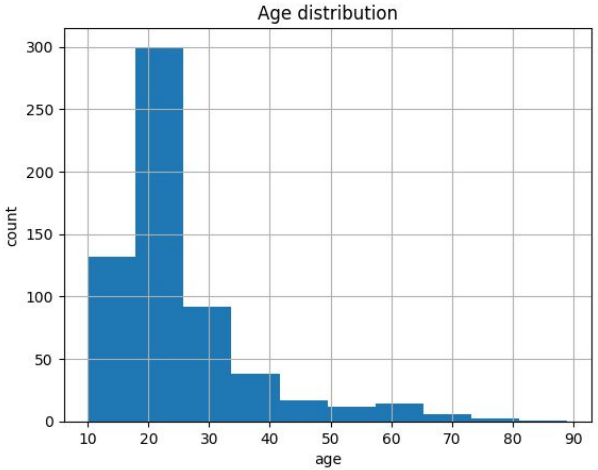


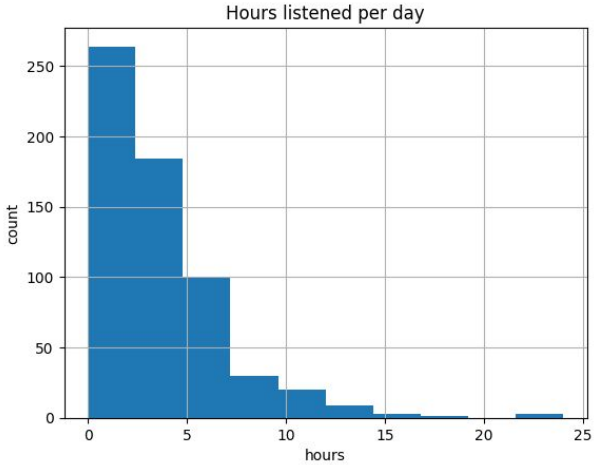


The self-reported mental health data has some biases:

- People were more likely to report high anxiety, and low on OCD and insomnia
- Depression was fairly even throughout

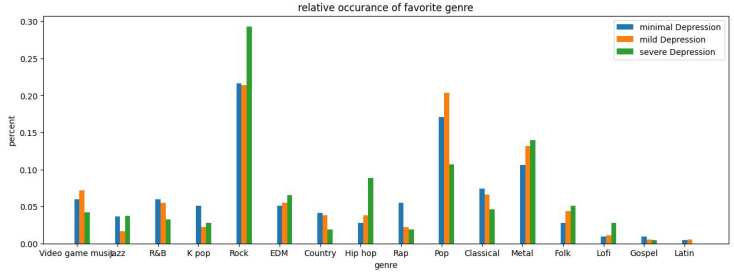
Data insights

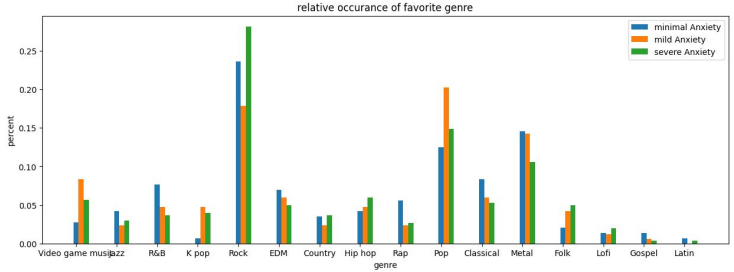


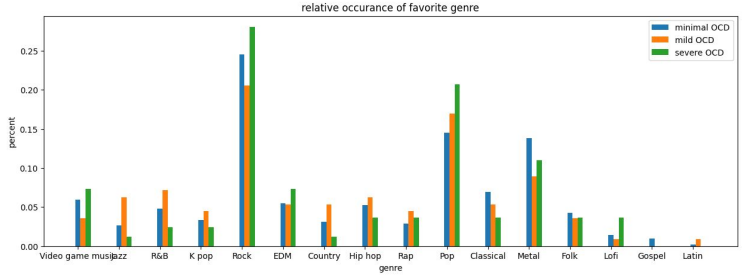


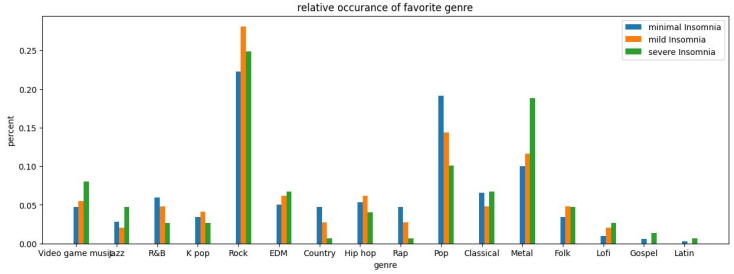
The majority of participants were between 18 and 25, and listened to 2-5 hours of music per day.

Data insights



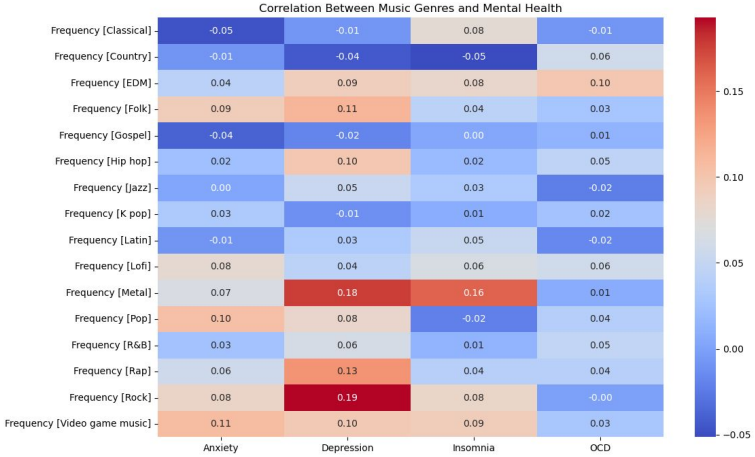




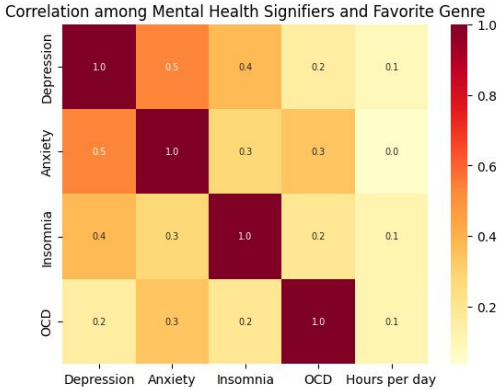


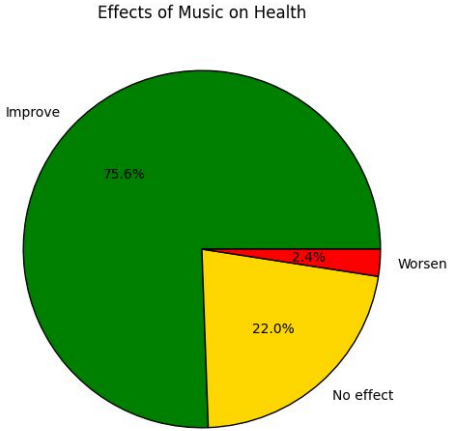
Within specific genres, different conclusions are observed; for example, rap fans in this survey seem mostly unaffected by mental health issues except mild OCD

Data insights



There is little *linear* correlation between preferring any one genre of music and any mental health condition. But overall, listening to music improves one's mood for the vast majority of respondents.



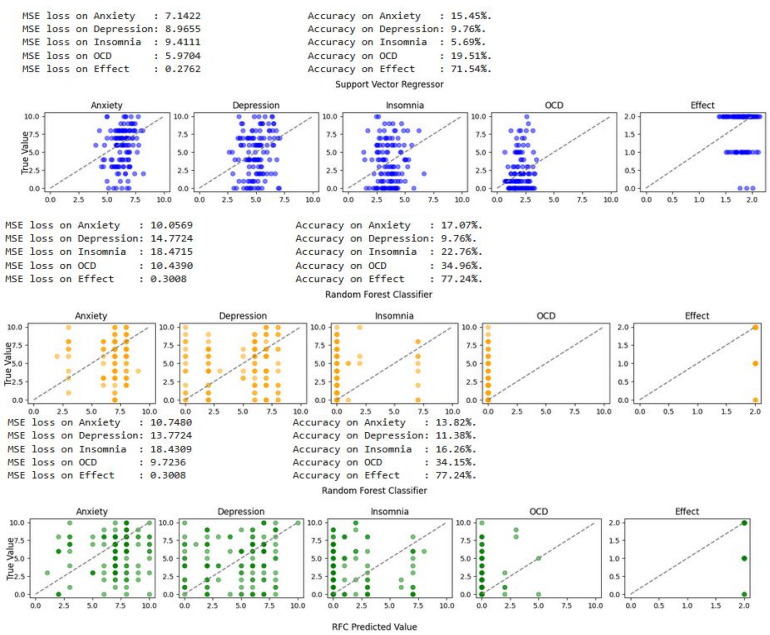


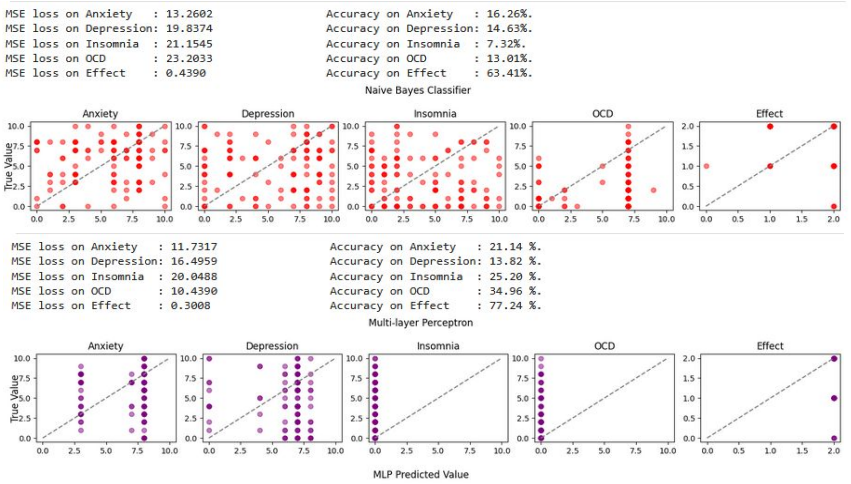
Prediction methodology

- We sought to determine if we can predict that someone suffers from a mental health condition, and how severe it is, based on their music preferences and musical habits, as well as the effect on their mood.
- We used a variety of statistical methods (SVR, SVC, random forest classifier, naive Bayes classifier) and deep learning methods (multilayer perceptron)

Model performance

- With SVR we regressively predicted a score, but with the classifiers we predicted between classes of integer scores between 0 and 10.





Results and Conclusions

- The models categorically scored poorly for all mental health conditions (though much better than naive guessing), and though they seem to have predicted the effect on mood that music has fairly well, the prior for music improving mood is very high at 75%, so the model gains little new insights.
- The visualizations also show little correlation between any of the heuristics and a given mental health condition.
- Conclusion: We cannot predict whether someone has a given mental disorder to some level of severity based on their music habits alone, but there is a strong correlation between listening to music and having an improved mood.