Putting Music Theory to the Test: Emotional Effects of Scales and Intervals

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Background: The aim of my project was to explore whether music theory techniques exert objective emotional effects on listeners and assess the effect of age, gender, race, and musical expertise. Methods: A Qualtrics survey was completed by 137 participants recruited through Facebook/email. Respondents listened to 7 scales scored on emotional perception, and 11 intervals ranked on brightness and consonance. Statistical analyses were conducted to assess the difference in means and correlations between scales' brightness, the consonance of sounds, combined brightness and consonance, and the determined values of perceived happiness versus sadness. The study was approved by an ethical committee. Results: The Spearman correlation test revealed a positive association between the perceived happiness of intervals and brightness ($R=0.86, p=0.02$), consonance ($R=0.79, p=0.05$), and a combined brightness and consonance of sounds ($R=0.88, p<0.01$). Scales' emotions appeared to correlate with one another. Statistical differences in interval perception differed by musical expertise. Discussion: The study reveals a statistically significant correlation between the scales' consonance and brightness and perceived feeling of happiness. Combining the two factors further increases the significance of the observed correlation. Higher level of musical expertise results in a significantly increased ability to correctly detect sounds. Conclusion: The observed correlations prove that there are objective ways to determine the emotional effect of combinations of sounds substantiating the previous claim that music theory is able to predict the subjective responses to notes that are meaningless individually, but form something greater when combined into a scale.

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