Emotional Perspectives of Fractal Music

Lukash, Daria (School: Lemon Bay High School)

Fractals are self-similar shapes that appear in nature and can produce complex structures by replicating the same pattern across several scales. While fractals have often been explored in visual art, sound is also geometric. Fractal music can be created by copying the same melody across different octaves and measures of time while maintaining the same notes. While existing studies evaluate how pitch, tempo, rhythm, intervals, style, and unpredictability affect emotions, no studies assess how fractal rhythms affect emotions. The purpose of this project is to fill that gap. First, an original melody was created. Second, the original melody was modified with fractal geometry to produce a new fractal melody. To remove any other external bias, create a baseline, and run statistical significance, the original melody served as the control group while the fractal melody served as the experimental group. Participants are asked to listen to the original melody for 30 seconds, and then to the fractal melody for 30 seconds and answer a survey. A Likert scale was used for quantitative data, while one voluntary open-response question was used for qualitative data. To determine the effects of fractal music on emotion, percent change and an Analysis of Variance (ANOVA) were calculated between the two groups for statistical significance. In total, 106 survey respondents and 55 short responses indicate that fractal music is more expressive, amusing, attractive, happier, and surprising and is less sad and fearful. Tension, anger, and disgust are not affected.

Awards Won: