CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

J0512

Project Title

Tricking the Brain Into Smelling Differently

Abstract

Objectives

My question was, How can the way the brain interprets the scent of cinnamon change after the nose is exposed to a strong scent before hand? My hypothesis was, Based on my research, test subjects will report smelling a different scent other than the scent of cinnamon while smelling cinnamon after their noses are introduced to the scents of vinegar, peppermint, oranges, and lemon. For my experiment, I tested four independent variables: peppermint essential oil, vinegar, lemon, and orange juice. My dependent variable was how many people smelled the cassia cinnamon essential oil differently than what it actually smells like. For the actual testing of the experiment, I tested one test subject at a time. I blindfolded the test subject, had them sit down in a chair, and I had them smell one of the IV s (not knowing what each IV was). One second after smelling the IV, I had them smell the cinnamon. I then asked them what they smelled when they smelled the second scent . I recorded their answer down, and I repeated this three more times, going through the rest of the IV s. For the results, 18 out of 30 people reported smelling cinnamon differently after smelling peppermint essential oil, 16 out of 30 for the orange juice, 15 people for the vinegar, and 14 people for the lemon. The reason for this may be because when the olfactory bulb, the smell sorting part of the brain, took in one of the independent variable scents, the smell triggered a memory in the amygdala and hippocampus. When the test subject then smelled the cinnamon, the olfactory bulb may have still been processing the previous scent, confusing the two scents and any scents that may have been related to the triggered memory, which made the test subject smell a new scent from the cinnamon. One revision to the experiment could be to use plastic containers to store the different objects emitting the scents.

Methods

Human consent form for each child (thirty count) for parent/legal guardian of child to sign, thirty children ages 12-14, 5 drops of cassia cinnamon Essential Oil (Essential Oils are used for diffusers), 5 drops of peppermint Essential Oil (Essential Oils are used for diffusers),1 tablespoon of vinegar, ¼ cup of orange juice, one half of a lemon, ¼ cup measure, tablespoon measuring instrument, five Ziploc plastic sandwich bags (Ziploc is prefered, but any brand of plastic sandwich bags will do as long as there are no tears/leaks in the plastic, it is waterproof, and it can be sealed close), a pair of latex gloves, 2 chairs, pencil with eraser, paper (as many sheets as you need to record answers), 2 cotton balls, and a blindfold.

Results

After testing thirty test subjects, eighteen reported smelling cinnamon differently after smelling peppermint, sixteen reported smelling cinnamon differently after smelling orange juice, fifteen reported smelling

Summary Statement

I tricked about more than half of thirty test subjects (human) into smelling the scent of cassia cinnamon differently than what it actually smells like.

Help Received

Jennifer Marshburn (mom) who helped to edit my research paper, Robert Marshburn (dad) who drove me to all of my science fair business, my grandmother who also drove me to places, and Mrs. Bridget Biernacki who convinced me to apply for the Greater San Diego Science and Engineering Fair.