Bias: motor control and favorite color

Health & Medicine, Body

Abstract

What is your favorite color and why? Do you think that simple tasks might be biased by your preferences? Find out in thisscienceproject if your color preferences will bias your fine motor skills when doing quick, repetitive tasks.

Objective

In this science project, you will test whether color preference will affect repetitive tasks that require fine motor coordination, like picking up small objects very quickly. Do Preferences Bias Our Choices?

Introduction

What does it mean to have a favorite color? It may be something that you choose for no good reason, other than the fact that you like it. You may have some kind of emotional reason for choosing a certain color. Can color preference have biological origins? When we see a color, it is interpreted in our brain by the visual cortex, where different groups of neurons are stimulated. The differential stimulation of neurons within the visual cortex might lead to color preferences. Do these preferences affect other brain functions, like our behavior? Our brains also coordinate the movements of our muscles. This occurs in the motor cortex of the brain. If you play sports or video games, you know that one helpful skill is hand-eye coordination. This means that the different regions of your brain function well together, allowing you to be well-coordinated. When you catch a fast-moving ball, your eyes tell the brain where the ball is, and then the brain tells your arm and hand to catch it. If these two areas of the brain can

coordinate complex movements and behaviors, then what other sensory responses can influence our behavior? In this science project, you will test how color can affect hand-eye coordination. You will ask participants to quickly choose different-colored M&M candies from a bowl. Will their choices reveal their color preferences? Terms and Concepts To do this type of science project, you should know what the following terms mean. Have an adult help you search the Internet or take you to your local library to find out more.

Preference

- Hand-eye coordination

- Movement

- Bias

- Visual targeting

- Differential stimulation of neurons

Biological Origin Questions

- How do preferences affect sudden choices, coordination, and movement?

- Will color preference influence the color of M&M's participants to pick up?

- Are visual targeting and hand-eye coordination biased by our color preferences?

Materials

- Buy 2 14-oz bags or 1 23. 1-oz bag of M&M's and count out 50 of each color, then combine those in a bowl.

- Buy 2 14-oz bags or 1 23. 1-oz bag of M&M's and count out 50 of each color, then combine those in a bowl.

- Dry measuring cup (if you bought individually colored M&M's)

- Large bowl

- Several participants (at least 12)

- Sandwich baggies (one for each participant)

- Permanent markers

- Lab notebook

- Graph paper

Experimental Procedure

1. Depending on which method you selected in the Materials and Equipment list, portion your M&M's into the large bowl.

2. Ask your first participant to pick out M&M's as quickly as possible, using only a two-finger pinch, and with one arm behind his or her back. The participant should place them on the table next to the bowl as they are pulled out. As your participant puts them on the table, silently count the number of M&M's on the table. When you see that the participant has pulled out 20 M&M's, ask him or her to stop.

3. Put the M&M's the first participant chose into a sandwich baggie. Ask the participant what his or her favorite color of M&M® is and write it on the baggie with a permanent marker.

4. Replace the M&M's that the participant removed with the same-colored M&M's that the participant took from the bowl. For instance, if he or she removed three red and five dark brown M&M's, replenish the bowl

with three red and five dark brown M&M's, not from the participant's sandwich baggie.

5. 5. Repeat steps 2 and 3 for all of your participants, replenishing the bowl with the same-colored M&M's as each participant removed after every trial.

6. Be sure that you have written each participant's favorite color on every baggie! If you forgot to write this down, the data cannot be used and the contents must be disposed of.

7. When you have collected data from several participants, sort your baggies into groups by the favorite color written on the baggies.

8. Starting with one " Favorite Color" group, tally the numbers of each colored M&M in the bags. Then move on to the next " Favorite Color" and do another tally, until you have tallied the numbers of all of the colored M&M's picked for each " Favorite Color" category. Record your data in a data table like the one below in your lab notebook:

Participant	Number of M&M's	Number of M&M's	Number of M&M's	Number of M&M's	Number of M&M's	Number of M&M's	To Nu M& Ch
Red							
Orange							
Yellow							

Green							
Blue							
Brown							

-

9. To be able to compare numbers between categories, you will need to normalize the data. Do this by calculating the percentages of each color picked for each " Favorite Color" category. First, add together the total number of M&Ms chosen for each " Favorite Color" in each row and insert that in your data table, like the one above. Then calculate the percentages in a new data table by dividing the number of M&M's chosen for a single color (from the Number of M&M's Chosen of Each Color column) by the total number of M&M's chosen (from the Total Number of M&M's Chosen column), and then multiplying your answer by 100. The new data table should look like this:

Percentage of M&M's Chosen of Each Color

Favorite Color M&M	Orange	Yellow	Green	Blue	Brown	Red
Red						
Orange						

Yellow						
Green						
Blue						
Brown						

-

10.   Now you want to find out if your participants chose their favorite color of M&M from the bowl more often than other colors. You can see this if you make a graph called a histogram for each " Favorite Color" M&M group. On the left side of the graph (y-axis), write a scale of percentages from zero to 100%. On the bottom of the graph (x-axis), write the series of M&M colors. Draw a bar for each color up to the matching percentage.

11.   Repeat step 10 for each of the favorite M&M colors. Did your participants tend to pick their favorite color? Evaluation (insert those graphs and table that were created)

Conclusion

Was I correct or not? If so How? If Not Why? How Could You Have Improved This project